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AMERICAN POMOLOGICAL SOCIETY.

PROCEEDINGS

OF THE

TWENTIETH SESSION

OF THE

AMERICAN POMOLOGICAL SOCIETY

HELD IN

GRAND RAPIDS, MICH.,

September 9th, 10th and 11th, 1885.

PUBLISHED BY THE SOCIETY
1886.

Report of the American Pomological Society.

To Hon. Marshall P. Wilder, President of the American Pomological Society:

My Dear Sir—I have the honor to submit herewith the transactions of the twentieth session of the American Pomological Society with supplementary reports.

The volume is larger than usual owing to the number of valuable papers presented at the convention. The evening lectures delivered by Prof. Chas. E. Bessey and Prof. A. J. Cook were admirably illustrated, and lose something of their value owing to the fact that the illustrations could not be carried into print.

You will note that in the very complete article by Prof. C. V. Riley, dates are mentioned succeeding the time of the convention, at which the paper was presented. This is due to the kindness of the author in afterward revising the contribution, and adding experience gleaned up to the date of placing it in type.

The experience of compiling this volume leads me to note the great importance of according the practice in the printed record with the spirit of the rules of nomenclature adopted by the Society. Always when the names of fruits are mentioned they should be the ones settled upon by the Society, through its proper committees. I should have taken the liberty to have established this method in the present compilation, if I could have had the data before me. I have labored under the disadvantage of not knowing the exact changes in nomenclature adopted by the Society; and in many cases you will note that the varieties mentioned in the discussions do not conform in their nomenclature to the Catalogue of Fruits furnished later by Mr. P Barry, the compiler of the catalogue.

I took the liberty to leave out of the recorded transactions such matters as had been thoroughly treated before, when no new facts were elicited.

The index is not as voluminous as that of previous volumes, owing to the fact that fruits simply mentioned in discussions are not recorded there by name. But all new fruits when discussed or rated may be found in the index.

I trust the contents of this volume may in your estimation be in no wise inferior to its predecessors. To Prof. W. J. Beal, whom I have succeeded in office, is due the credit of having secured so large a number of contributions from specialists in pomology and the sciences which aid in its development. Faithfully yours,

CHAS. W. GARFIELD,

Secretary of the American Pomological Society.

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Phœnix, F. K.	Delavan	Wisconsin.
Pratt, E. H.	Rochester	New York.
Pullen, Chas. P.	Memphis	Tennessee.
Ratliff, Joseph C.	Richmond	Indiana.
Reynolds, P. C.	Rochester	New York.
Robinson, E. C.	Portland	Maine.
Rogers, Jesse B.	Millburn	New Jersey.
Satterlee, James	Lansing	Michigan.
Saul, John	Washington	Dist. Columbia.
Scott, E. H.	Ann Arbor	Michigan.
Simonds, O. C.	Wright's Grove	Illinois.
Stickney, J. S.	Wauwatosa	Wisconsin.
Strentzel, Dr. John	Martinez	California.
Tamari, Kizo	Consulate for Japan	New York City.
Taylor, E. B. L.	Rochester	New York.
Toon, J. J.	Atlanta	Georgia.
Trowbridge, G. W.	Glendale	Ohio.
Willard, S. D.	Geneva	New York.
Williams, E.	Montclair	New Jersey.
Woodward, J. S.	Lockport	New York.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN POMOLOGICAL SOCIETY.

CONSTITUTION.

ARTICLE 1. The name of this Association shall be the AMERICAN POMOLOGICAL SOCIETY.

2. Its object shall be the advancement of the science of Pomology.

3. It shall consist of delegates appointed by Horticultural, Agricultural, and kindred Societies in the United States and British America, and of such other persons as take an interest in the welfare of the Association, and are desirous of promoting its aims.

4. The meetings shall be held biennially, at such time and place as may be designated by the Society; and special meetings may be convened at any time on the call of the President.

5. The officers shall consist of a President, a First Vice President, one Vice President from every State, Territory and Province; a Treasurer and a Secretary; and shall be elected by ballot or otherwise at every biennial meeting.

BY-LAWS.

1. The President shall have a general superintendence of the affairs of the Society during its vacation; give due public notice of the time and place of meeting; preside at its deliberations; deliver an address on some subject relating to Pomology, at every biennial meeting; and appoint all committees, unless otherwise directed.

2. In case of the death, sickness, or inability of the President, his official duties shall devolve on the First Vice President or such one of the Vice Presidents as the Society may elect by ballot or otherwise.

3. The Treasurer shall recieve all moneys belonging to the Society, and pay over the same on the written orders of the President.

4. The Secretary shall, with the assistance of a reporter appointed by him, keep a record of the transactions of the Society for publication.

5. There shall be an Executive Committee consisting of five members, together with the President and Vice Presidents, *ex-officio*, five of whom shall constitute a quorum, who shall manage the affairs of the Society during its vacation.

6. Chairmen of Fruit Committees, for every State, Territory and Province, and a general Chairman over all, shall be appointed biennially. It shall be the duty of each of such Chairmen to appoint four additional members of his committee, and with their aid, and such other information as he can procure, to forward to the general Chairman one month before every biennial meeting, State Pomological Reports, to be condensed by him for publication.

7. A Standing Committee on Native Fruits, consisting of eleven members, shall be appointed by the President immediately after his election. It shall be the duty of this Committee to report annually on native fruits, and also to examine, and before the close of the session report on, all new seedling varieties that may be exhibited: and to make an *ad interim* report on those that were exhibited in an unripe condition at the meeting of the Society, but had subsequently attained a state of maturity; and on such other seedlings as may have been submitted to their inspection during the Society's vacation.

8. A Standing Committee on Foreign Fruits, consisting of seven members, shall be appointed, whose duties shall be similar to those of the committee in by-law seven.

9. A Standing Committee on Nomenclature, consisting of seven members, shall be appointed biennially.

10. Vacancies occurring in committees shall be filled by the chairman of each, and in case of his death or inability to serve, his place shall be supplied by the President of the Society.

11. The members of this Society shall pay four dollars biennially; and twenty dollars paid at one time shall constitute one life membership.

12. The order of business for each meeting shall be arranged by the Executive Committee.

13. The Constitution and By-Laws may be altered or amended, at any regular biennial meeting, by a vote of two-thirds of the members present.

Proceedings of the Twentieth Session

OF THE

AMERICAN POMOLOGICAL SOCIETY,

CONVENED IN GRAND RAPIDS, MICHIGAN,

September 9, 10 and 11, 1885.

Secretary's Prefatory Note.

As early as during the winter of 1884–5, Prof. W. J. Beal, then Secretary of the American Pomological Society, addressed letters of inquiry to the active workers in the society, asking their counsel as to the best method of conducting the next convention, and importuning them to suggest any new plan by means of which, the society could be made more useful to its membership and to American pomology.

It was owing to some of the thoughts contained in the responses, that the convention did not follow closely the plan of former meetings. Less time was devoted to the discussion of varieties in detail, and more to the consideration of questions connected with management in horticultural operations, and means of overcoming difficulties. One of the best of these letters was from Charles A. Green, of Rochester, N. Y., who insisted upon the desirability of paying less attention to the local celebrities, which are to be exhibited, and more to the business of the meetings. He felt that the time spent in visiting art galleries, museums, libraries, parks, manufactories, etc., etc., was largely wasted, not because it is not nice to see these things, but because pomologists spend time and money attending these conventions for a special purpose not akin to these things. He advised short papers and ready discussions. The best men, the ones we want to hear from most, need to be drawn out, hence he would give especial attention to accomplishing this purpose. He considered it important that some one person be expected to lead every discussion following the paper, if there be one.

President Wilder advised that there should be no adjournment to visit anything or anybody, but that the business of the convention should be attended to with the greatest fidelity. That the details of starring and grading varieties should be given to the Committee on Catalogue, and not occupy the time of the convention. He advised that there be no banquet, but that in place of it, there should be an evening at the hall of meeting, given to short speeches, and a good many of them from people dwelling widely apart, in the territory covered by the society.

Secretary Beadle, suggested that the public discussion of the fruit catalogue, rest for one session, and in lieu thereof, a considerable time be given to personal experiences with the newer varieties.

There were other letters full of excellent suggestions, and in deference to them, Prof. Beal moulded his programme, so as to include as many of the good things as was possible.

The local committee at Grand Rapids, consisting of Samuel L. Fuller, Chas. W. Garfield, W. N. Cook, and W. K. Munson, after ascertaining the wishes of the officers, said that Grand Rapids would furnish what was asked for, to-wit: A

quiet hall of meeting of ample capacity, near the leading hotels; a well lighted hall for the exhibit near the convention hall; immunity from extortion at the hotels; cold storage for perishable fruits, sent previous to the meeting; and no excursions nor banquets to disturb the work of the meeting.

The Michigan Horticultural Society, had at an early date, selected as a welcoming committee, Hon. Byron G. Stout, of Pontiac; Hon. Henry G. Reynolds, of Grand Rapids; Hon. A. J. Webber, of Ionia; Hon. Wm. L. Webber, of Saginaw; Judge J. G. Ramsdell, of Traverse City, and Hon. W. K. Gibson, of Jackson.

The American Society early in the spring of 1885 issued its preliminary circular announcing the date and place of meeting, and in a general way the topics for discussion. The State Committee secured President Angell, of the Michigan University, to deliver the welcoming address; and the local committee secured the first Universalist Church as a hall of meeting, the North Division Street Armory for the exhibit of fruit, and ample cold storage facilities.

For some days previous to the opening of the convention, the Grand Rapids daily press kept the public acquainted with the promises of the meeting; and large placards and banners announcing the places of meeting were posted in conspicuous places.

OPENING SESSION—WEDNESDAY, SEPT. 9th.

Notwithstanding the inclemency of the weather caused by a drizzling rain which continued throughout the day, the opening session of the Society was well attended, by citizens, representatives from all sections of the United States, and Canada, and a visiting delegation from Japan.

A monogram containing the initials of the Society, A. P. S., made of asters in colors, hung upon the organ at the front of the church. Ushers from the local society waited upon delegates from abroad, and when the gavel of Secretary Beal at 10 o'clock A. M., called the meeting to order, the church was well filled.

The Secretary, in calling the Convention to order, said it was with heartfelt regret that he was compelled to announce that the venerable President of the Society, Hon. Marshall P. Wilder, was unable to be present, and read from him the following communication:

"*Gentlemen of the American Pomological Society:*

"I still live and would most gladly be with you on this occasion, but as 'discretion is the better part of valor,' I am compelled by the advice of friends of our cause, not to take the risk of so long a journey and the consequent fatigue of our session, but to reserve my health and strength in the hope that you will come to meet me at Boston in 1887, when we may consult personally again, on the great interests which our Society has in charge. I herewith transmit my address, in which I have endeavored to show the immense work it has already accomplished and its future duty in directing and governing the pomology of this western world."

In the absence also of the first Vice-President, Hon. P. J. Berckmans, of Georgia, Patrick Barry, of Rochester, N. Y., was chosen chairman of the Convention.

On taking the chair amid the applause of the delegates, Mr. Barry expressed his regrets at the absence of the President, and called upon the Rev. Charles Fluhrer, of the city, who opened the meeting with prayer.

WORDS OF WELCOME.

President T. T. Lyon then addressed the following words of welcome, in behalf of the Michigan State Horticultural Society:

MR. PRESIDENT:—I regard it as a proud day when we are privileged to welcome the American Pomological Society to Michigan.

Our people have heretofore learned very much from your Society, at a distance, through its discussions, its catalogues, and the various other means through which it has been accustomed to disseminate valuable information among the people.

Our State, by means of its virgin soils and favorable climate, coupled with the fortunate circumstance that very many of its pioneers came to us from the East, already imbued with a fondness for the culture of fruits, has been enabled to win a pomological reputation upon which we somewhat pride ourselves; but whatever we, as a people, may have accomplished in this direction, must, in large measure, be attributed to the influences your Society had already brought into action.

When the American Pomological Society was organized, if we can be said to have had an American Pomology, or even an American Pomologist, it was assuredly in a very crude and chaotic condition: and to this Society must be mainly conceded the honor of having evolved order out of confusion—system out of chaos.

While we feel that Michigan has done something in this broad field, we hope to learn very much more from this gathering of the notables of pomology among us; and we shall be most happy if, in coming among us, you shall become imbued with a more perfect, and possibly a higher idea of the capacities of our State, and the status of its people, upon the subject we have so much at heart. Knowing that we have much to do at this meeting, my remarks shall be brief.

It is to be hoped that this will not be your last meeting among us, and that you will long continue in the good work. The farther we progress the more does the good work develop and amplify among us, and the more do we realize that we have hardly, even yet, fairly commenced the cultivation of the ample field before us.

The Society has certainly a great work yet to do, not for Michigan only, but for the entire continent, since its organization is not local, nor yet national, but as broad as its title imports.

We can scarcely overestimate the importance of pomology—fruit culture—as a civilizing, educating, elevating and refining influence, and the consequent importance of our mission; hence we hope to profit greatly in these respects from your assemblage among us.

The chair then called upon Mayor Curtiss, of Grand Rapids, who, in a few fitting words in behalf of the city, welcomed the Society.

The address in behalf of the State was then delivered by Dr. James B. Angell, President of the State University.

ADDRESS OF PRESIDENT ANGELL.

President Angell spoke substantially as follows:

Those who are authorized to make arrangements for this meeting have charged me with the agreeable duty of giving you a most cordial welcome to this State. You may readily believe that no State can be more delighted by your presence than Michigan, whose energies are so largely devoted to the culture of fruit. She rejoices in your history, your work and your triumphs. She is glad of an opportunity to express her indebtedness to you. She recalls with gratitude and with pride the eminent services of the men who have given inspiration and guidance to this society, and especially the services of that veteran and enthusiastic pomologist, whose name can never be forgotten at these meetings, and whose absence through the infirmities of age, we so much regret, your worthy President, Marshall Pinckney Wilder. You know better than I can tell you how this country has made more rapid progress perhaps in no particular during this generation than in the cultivation of fruit. The memory of most of us easily runs back to the time when few or no cultivated strawberries were to be found anywhere in this land; and how many of you can easily enumerate, I suppose, 400 or 500 varieties. Substantially the same statement can be made concerning the grape. Similar, if not equal, progress has been made with other fruits. I have not the statistics at hand, but I suppose the value of the fruit crop of the United States in a good year must approach $100,000,000. And the increase in the quantity has hardly been more remarkable than the improvement in quality and flavor.

Furthermore, you have by your multiplication of varieties, and your increased skill in packing and transportation, greatly lengthened the period during which we consumers can enjoy the luscious fruits. And still more, who can estimate the elevating and refining influence on intelligence, taste and character which attention to the delicate processes of pomology has wrought on this people. For you do truly cultivate both a science and an art, and your act often rises from a practical almost to a fine art. You have to study nature as closely and make your deductions as carefully as a zoologist or a geologist, and many of you seek for grace and beauty with almost as delicate an æsthetic sense as that of the sculptor or the painter. In all this wonderful progress, the services of this society have been conspicuous. By your accurate classification, by your careful nomenclature, by your prolonged experimentation, by your courageous condemnation of worthless varieties, by your discussions and published reports, and especially by your contagious enthusiasm, with which you have fired the whole people, your beneficent influence has been felt from Canada to Texas, and from Florida to California. We believe that such a society must find Michigan a congenial place of meeting. You know that fruit raising is one of her principal industries. Our friend, Mr. Garfield, will tell you that she produces in a favorable year fully 5,000,000 bushels of apples, while peaches, pears, grapes, plums, and various small fruits are grown in large quantities. Her facilities for transportation both by rail and by water are of the very best. The rapidly increasing population of the west, furnishes a ready market even for her more perishable products. It must be confessed that nature has been very gracious here, to the fruit grower. She has furnished him a rich, warm and mellow soil, which seems made for orchards, vineyards and

gardens. She has surrounded this fair peninsula with the great lakes, which not only encircle her as a zone of beauty and furnish her a highway for commerce, but which also temper her atmosphere by their genial warmth in winter and by their cooling breath in summer. Though occasionally we suffer from a severe winter like the last, as a rule the friendly lake on the west draws the sting from the tail of the Dakota blizzard, and shelters our fruits up even to the northern extremity of the lower peninsula. In no State east of the Rocky mountains can delicate fruits be grown in so high latitudes as in this. During most of the year breezes soft as those of Eden woo the peach and the grape and the pear, and coax them to rejoice us with the autumnal splendor of their fruitage. A drive through any of the western counties at any time from June to October will delight the eye with a view which rivals that in the fabled garden of the Hesperides. If we have not Paradise, we have at least a charming suggestion of it.

We believe, too, that we have a people of sufficient intelligence to pursue this work of fruit-raising, which requires brains as well as industry. It was long ago said that God sifted the nations of the Old World to find the finest wheat with which to plant the colonies of America. We think we may say without presumption that He sifted New England, New York and Ohio that He might find a portion at least of their best men and best women for the planting of Michigan. They brought here habits of industry, high moral purpose and a passion for education. In the wilderness, the log school house rose simultaneously with the log cabin, which formed the house. Go to any of our villages and towns, the chances are that the largest and finest edifice you will see is the public school house. Every boy and every girl born on the soil of Michigan, whatever their color, whatever their poverty, see their road open, plain and clear, from the log school house, through the grammar school and the high school, to the State Normal school, the Agricultural college, or the University, almost without money and without price. We believe, therefore, that you will find here a people prepared to profit by the instruction, which you can draw for them from rich and varied experience. In their name, I beg to give you a most hearty welcome, and to thank you for the honor you do them by meeting on the soil of Michigan.

APPOINTMENT OF COMMITTEES.

The following committees were then appointed:

On Credentials—Prof. W. R. Lazenby, Ohio; Horace Eaton, Massachusetts; E. H. Scott, Michigan.

Auditing Committee—G. W. Campbell, Ohio; H. M. Engle, Pennsylvania.

On Nominations—A. E. Gipson, Colorado; P. M. Augur, Connecticut; William Saunders, District of Columbia; J. J. Toon, Georgia; C. M. Hobbs, Indiana; J. L. Budd, Iowa; Robert Manning, Massachusetts; C. J. Monroe, Michigan; P. M. Gideon Minnesota; L. A. Goodman, Missouri; C. E. Bessey, Nebraska; J. B. Rogers, New Jersey; Elisha Moody, New York; W. W. Hilborn, Ontario; Charles Gibb, Quebec; H. L. Lyman, Virginia; G. W. Campbell, Ohio; H. M. Engle, Pennsylvania; Parker Earle, Illinois; T. V. Munson, Texas. Dr. C. E. Bessey was designated as chairman and T. V. Munson, Secretary.

On Exhibit of Fruits and Awards—Dr. F. M. Hexamer, New York; Robert Manning, Massachusetts; T. V. Munson, Texas; J. J. Harrison, Ohio; A. W. Harrison, Pennsylvania.

On Resolutions—W. C. Strong, Massachusetts; Dr. Samuel Hape, Georgia; Prof. J. L. Budd, Iowa.

DELEGATES PRESENT.

Prof. Lazenby made the following report of the Committee on Credentials:

Your Committee found great difficulty in eliminating from the list of delegates authorized by the various societies the names of those not able to be present. The following is approximately correct:

Massachusetts Horticultural Society—John B. Moore, Wm. C. Strong, Benjamin G. Smith, Robert Manning, J. W. Manning, William H. Spooner, Horace Eaton, Arthur W. Felton, Asa Clement.

Indiana Horticultural Society—Sylvester Johnson, J. Troop, C. M. Hobbs, Jas. G. Kingsbury, Jos. Ratliff.

Nebraska Horticultural Society—Chas. E. Bessey.

Iowa Horticultural Society—Jas. L. Budd.

Wisconsin Horticultural Society—J. C. Plumb, Geo. C. Peffer, Wm. Trelease.

Minnesota Horticultural Society—Peter M. Gideon.

Colorado Horticultural Society—A. E. Gipson.

Department of Agriculture, Washington, D. C. —Norman J. Coleman, Wm. Saunders.

Georgia Horticultural Society—Samuel Hape, J. J. Toon, H. F. Emory.

Virginia—C. A. Uber, H. L. Lyman.

Pennsylvania Horticultural Society—Wm. H. Moon, Howard A. Chase, Henry M Engle, Geo. B. Thomas, A. W. Harrison, T. A. Andrews, W. B. Lane, Henry Haines, Gideon N. Greer, Wm. Parry.

New York American Institute Farmers' Club —F. M. Hexamer, J. S. Woodward, J. B. Rogers, P. M. Augur, A. J. Caywood, John S. Collins, David Baird, E. T. Field, Ezra Osborne, T. Greiner, S. T. Chapin, H. Hendricks.

New York Experiment Station—J. C. Arthur.

Western New York Horticultural Society—P. Barry, George Ellwagner, P. C. Reynolds, Elisha Moody, C. L. Hoag, B. W. Clark, T. S. Hubbard, P. M. Nichols, Theo. Smith, E. B. L. Taylor, H. H. Farley, Robert Johnsôn, E. H. Pratt, H. Gregory.

Chautauqua County Agricultural Society— Geo. S. Josslyn.

Society for Promotion of Agricultural Science —W. J. Beal, W. R. Lazenby, C. E. Bessey.

Ontario Fruit Growers' Association—W. W. Hilborn.

New Jersey Horticultural Society—Wm. Parry, John R. Parry, J. S. Collins, E. T. Field, David Barick, J. B. Rogers, T. F. Baker.

Maryland Horticultural Society—S. T. Jenkins.

Ohio Horticultural Society—N. Ohmer, Geo. W. Campbell, W. J. Green, A. G. Babcox, L. B. Pierce, J. J. Harrison, L. R. Jayne, G. J. Streator, J. H. Tryon, H. Y. Beebe.

Ohio Experimental Station—W. R. Lazenby.

Ohio Board of Agriculture—W. I. Chamberlain.

Texas Horticultural Society—T. V. Munson.

American Horticultural Society—Parker Earle, T. V. Munson, Samuel Hape,

Missouri Horticultural Society—N. J. Coleman, L. A. Goodman.

Connecticut Board of Agriculture—P. M. Augur.

Michigan was represented by a large number of delegates regularly appointed by various organizations in the State, as follows:

State Board of Agriculture—Henry Chamberlain.

State Agricultural Society—Henry Fralick, H. O. Hanford, M. Shoemaker.

State Horticultural Society—Delegates at large —T. T. Lyon, J. G. Ramsdell, B. Hathaway, E. F. Guild, Wm. L. Webber, Chas. W. Garfield, S. M. Pearsall, W. J. Beal, L. H. Bailey, Jr., A. J. Cook, C. F. R. Bellows, Byron G. Stout.

West Michigan Farmers' Club—S. L. Fuller, E. L. Briggs, G. S. Linderman, O. Van Buren, E. T. Bosworth, John Sailor.

West Michigan Fruit Growers' Association— Walter Philips, H. H. Holt, H. C Sherwood, G. H. La Fleur, A. J. Knisely, A. S. Kedzie, W. A. Brown, Jos. Lamin.

The following branches of the Michigan Horticultural Society were represented by the delegations named:

Allegan County Pomological Society—H. G. Buck, G. H. La Fleur, E. C. Reid, W. B. Audrus, M. T. Smith, Allen Wood.

Grand River Valley Horticultural Society— G. G. Bennett, J. A. Hovey, P. W. Johnson, R. D. Graham, W. N. Cook, Thos. L. Brown, W. K. Munson, H. H. Hayes, Eugene Davis, John S. Walker, W. E. Calkins, J. K. Johnston, A. R. Antisdel, Henry Spring, Thos. D. Gilbert, N. L. Avery, W. K. Emmons, J. W. Pennell, C. E. Knapp, E. Manley, C. L. Bissell, L. C. Woodman, E. C. Phillips, T. F. Richards, F. E. Skeels, S. P. Wormley, Chas. Leonard, M. W. Bates, Z. Cheney, H. D. C. Van Asmus, E. M. Ball, H. M. Dickenson, P. V. Fox, Jos. A. Pierce, E. U. Knapp, S. S. Bailey, Henry Smith, Thos. Martin.

Saugatuck and Ganges Pomological Society— J. F. Taylor, D. W. Hinman, J. S. Owen, N. W. Lewis, Miss E. J. Fox, Wm. Corner, O. S. Bush, P. Purdy, Wm. H. McCormick.

Lawton Pomological Society—Mr. and Mrs. G. W. Lawton, Mr. and Mrs. C. D. Lawton.

Berrien County Horticultural Society—W. A. Brown, A. J. Knisely, W. A. Smith, H. N.

Sheldon, R. W. Van Brunt, F. Morley, C. H. Farnum, R. Morrill, S. Hady.

Oceana County Pomological Society—C. A. Sessions, E. J. Shirts.

Bay County Horticultural Society—B. F. Partridge.

Lenawee County Horticultural Society—D. Wood, Marrd. and Mrs. F. J. Hough, N. J. Strong, B. W. Steere, E. W. Allis, A. L. Mills, Peter Coller.

Eaton County Horticultural Society—David Hale, Wm. P. Green, S. R. Fuller, F. H. Parker.

Jackson County Horticultural Society—W. K. Gibson, R. T. McNaughton, M. Shoemaker.

Ingham County Horticultural Society—James Satterlee, A. J. Cook.

Muskegon County Horticultural Society—H. H. Holt.

Washtenaw County Pomological Society—E. H. Scott, J. E. Sumner, E. Bauer, J. Ganzhorn, A. A. Crozier, J. C. Hubner, O. R. L. Crozier, John B. Dow, Mrs. Baxter, Mr. and Mrs. L. D. Watkins.

Barry County Horticultural Society—Porter Burton, J. C. Woodruff, H. E. Handy, Mr. and Mrs. Eugene Davenport.

Genesee County Horticultural Society—C. T. Rosenkranz, E. J. Pierson, N. A. Beecher, E. H. Rockwood.

Lenawee and Hillsdale Horticultural Society—Porter Beal.

Spring Lake Horticultural Society—W. G. Sinclair, D. G. Alston, George Seagrove, J. S. Sessions, Eno. Pruim, Frank Hall.

South Haven and Casco Pomological Society—Mr. and Mrs. C. J. Monroe, F. R. Linderman, J. W. Humphrey, J. J. Atherly, L. H. Bailey.

Grand Haven Horticultural Society—A. S. Kedzie, Charles E. Russell, Walter Phillips, E. W. Branch, George Bird, E. D. Andrews, E. R. Harris.

Wayne County Horticultural Society—H. O. Hanford.

W. R. Lazenby,
Horace Eaton,
Evart H. Scott,
Committee.

FINANCIAL STATEMENT.

The following report was made by the Treasurer of the Society:

Grand Rapids, Mich., Sept. 9, 1885.

To the President and Members of the American Pomological Society:

Gentlemen:—I present herewith a statement of the receipts and disbursements of the Society for the two years ending September 5th, 1885, to-wit:

RECEIPTS.

Sept. 1, 1883.—Balance from old account		$1,518 26
Sept. 7, 1885.—Cash received for biennial memberships from Sept. 1, 1883 to Sept. 7, 1885		368 00
Sept 12, 1883.—John S. Haynes, gratuity		4 00
" " " —Henry C. Haynes, gratuity		4 00
" " " —Thomas Hogg, gratuity		3 00
Sept. 1, '83 to " 7, 1885.	Life members	200 00
Sept. 12, 1883.—Thomas A. Harvey, additional to life membership		10 00
" " " —Geo. W. Campbell, additional to life membership		10 00
" " " —Henry M. Engle, additional to life membership		10 00
Oct. 12, 1883.—F. M. Marble, to complete life membership		16 00
Aug. 18, 1885.—Abner Allen, to complete life membership		16 00
Sept. 4, 1885.—Provident Institution of Savings, Boston, interest to July 1, '85, on deposit		70 46
		$2,229 72

DISBURSEMENTS.

Sept. 21, 1883.—B. G. Smith, expenses, Philadelphia		$ 39 00
" 25, " —W. J. Beal, postage and printing		8 50
Dec. 31, 1883.—Printing circulars (W. S. George & Co.)		7 00
Jan. 5, 1884.—Postal cards and printing, postage stamps, stationery, (W. J. Beal)		18 00
June 18, 1884.—Postage stamps (W. J. Beal.)		54 00
" " " —W. J. Beal, on account salary, as Secretary		100 00
" " " —W. S. George & Co., printing proceedings and expenses per contract, American Pomological Society		682 20
Sept. 28, 1883, to June 28, 1884.	B. G. Smith, telegrams, postal cards, envelopes and printing, postage stamps, stationery, freight on books and sundries.	30 34
Oct. 23, 1884.—Tolman & White, printing		6 00
Mar. 21, 1885.—W. J. Beal, bill printing, postage stamps, etc		28 00
July, 1885, to Sept. 7, 1885.	B. G. Smith, express, postage stamps, printing circulars, postal cards and printing	29 99
Sept. 7, 1885.—Balance to new account		1,226 69
		$2,229 72

The Auditing Committee made the following report:

Grand Rapids, September 7, 1885.

The undersigned having been appointed Auditing Committee, report that, we have examined the above account, and compared it with the accompanying vouchers, and find it correct.

[Signed.] George W. Campbell,
H. M. Engle.

On motion the two reports were accepted and adopted, and the Secretary authorized to have them placed in the Transactions of this meeting.

The association then took up the matter of the

PLACE OF MEETING FOR 1887.

J. B. Moore, President of the Massachusetts Horticultural Society, read an invitation from that society for the American Society to hold its next biennial session at Boston, in 1887.

Members from New York, Pennsylvania and other States expressed a wish that the next meeting could be held in their respective localities, but in deference to the expressed wish of President Wilder, formal invitations were withheld, and on motion of Mr. H. M. Engle, of Pennsylvania, the invitation of the Massachusetts Horticultural Society was unanimously accepted by a rising vote.

The Society took a recess until two o'clock.

WEDNESDAY—AFTERNOON SESSION.

Owing to the many attractions in connection with the great exhibit in Armory Hall, the delegates were slow in gathering for the afternoon session. However, at about half-past two o'clock, Chairman Barry called the meeting to order, and announced as the first work of the session,

REPORTS OF COMMITTEES.

The Committee on Nomination of Officers for the ensuing two years through the Chairman, Dr. C. E. Bessey, of Nebraska, reported the following names for the leading places:

For President—Marshall P. Wilder, of Massachusetts.

For First Vice-President—P. Barry, of New York.

For Treasurer—Benjamin G Smith, of Massachusetts.

For Secretary—Chas. W. Garfield, of Michigan.

A vice-president for each State and territory was named, (see list of officers on an earlier page).

On motion of Mr. Ellwanger, of New York, the Secretary was authorized to cast the ballot of the Society for the persons nominated by the committee. The Secretary delegated the duty to the chairman of the committee, and the ballot was cast as reported by the committee.

The following resolution unanimously adopted, was offered by Mr. W. C. Strong, of Massachusetts:

Resolved, That we are under special obligations to our retiring Secretary, Dr. W. J. Beal, of the Michigan Agricultural College (Lansing, Mich.), for the very effective and satisfactory manner in which he has discharged the duties of his office during the past four years, and we greatly regret that duties in other directions preclude his further continuance in this position.

REPORT ON NATIVE FRUITS.

T. T. Lyon, Chairman of the Standing Committee on Native Fruits, made a short verbal report, and later submitted the following, which is inserted here:

Hon. Marshall P. Wilder, President American Pomological Society:

The undersigned, Chairman of Standing Committee on Native Fruits, would respectfully submit the following report of varieties of new native fruits, that have been submitted to his examination, or have fruited on his own grounds during the interim, since the session of the society, at Philadelphia, in 1883

APPLES.

Supposed Seedling—at Benton Harbor, Michigan; size, medium, roundish-oblate; yellow, with two shades of red, obscurely striped and splashed. Dots few small, golden yellow. Basin medium, narrow, abrupt, plaited. Calyx small, closed, stem rather short. Cavity medium, regular, not russeted. Flesh yellowish-white, tinged red next to the skin, granular, breaking, tender, rich subacid, excellent. As beautiful as the Red Astrachan, valuable for dessert and market, if the tree shall prove vigorous and productive.

Unnamed Seedling—from W. B. Whitney, Leominster, Mass.; size medium, irregular, roundish, rich, deep yellow, blushed; with many whitish or grayish dots. Calyx closed; basin broad, shallow, plaited, stem three-fourths inch long, rather stout; cavity deep, narrow, irregu-

lar. Flesh, greenish yellow, fine-grained, tender, crisp, juicy, mild subacid, "very good." A nice dessert apple, of fair appearance; but its value must depend very largely upon questions of vigor, hardiness, productiveness, etc. Season, apparently, about midwinter. Said, by the sender, to be in use from November till June.

CHERRIES.

Michigan (Beauty)—received on July 8, 1884, from Stephen Cook, of Benton Harbor, Michigan; a supposed cross of Black Tartarian upon Bigarreau. First fruited in 1877; more hardy than the parent. An early and full bearer. Fruit large, long heart-shape; deep red, nearly black; ripe July 10th to 15th; stems long, $1\frac{3}{4}$ inches. Fruit without suture, slightly compressed; texture very firm, juicy, sweet, or very mild vinous. A very attractive fruit; an excellent handler, and said to be very nearly rot proof.

Centennial—specimens of this were received, by mail, on July 6th, 1885, from Coates and Tool, of Napa Valley, California. It originated with Henry Chapman, from seed of Napoleon, and first fruited in 1876.

The following description was received from T. L. Kinsey, member of this committe; of Georgia, to whom specimens had also been sent. "Size large, slightly oblate, amber, with dark crimson marbling. Flesh firm, sweet and rich; quality best, condition excellent, showing its good shipping qualities."

GRAPES.

Blue Seedling—received by Mr. Kinsey, from J. B. Jones, Herndon, Burke County, Georgia, of which he sends the following description: "An accidental seedling, now seven years old; yielded its first crop, fourth year. Bunches, medium, loose. Berries medium, round, blue-black; pulp dissolving, exceedingly juicy, vinous and of delicate aroma; skin, thin; quality best; maturity, middle of August. Belongs to the cordifolia type, of which it is perhaps, the best offering yet brought to notice. Vine exceedingly vigorous and healthy. Fruit has never decayed or dried up; a valuable new variety."

Downing—specimens received, November 7th, 1884, from J. G. Burrow, Fishkill, N. Y. Fruit very large, oval, dark-purple; bloom dense, bluish, cluster long, rather compact; skin thick, slightly astringent; pulp tender, breaking; juice abundant, colorless, not musky; flavor mild vinous, evidently a good keeper; said to ripen September 20th, and to keep till spring.

Unnamed Seedling Grape—received October 2, 1885, from Jas. J. Robinson, Lamont, Michigan. An accidental with Mrs. E. Mason, originating in 1881; bore its first crop of fruit, (15 to 20 pounds) in 1885; its foliage is Labrusca; bunch medium, cylindrical, not shouldered; berry medium, round; skin thin, but firmer; bloom thin, whitish; color reddish amber; season, probably about with Delaware. Flesh nearly colorless; pulp tender, breaking, jucy, vinous, sprightly, "very good," slightly foxy; a moderate grower; foliage slightly lobed, pubescent.

PEACHES.

Husted's, No. 11—Is understood to have originated at Lowell, Michigan, several years since. The originator, who also has a plantation in Middle Georgia, having brought it to the notice of Mr. Kinsey, he sends the following description of it as grown there: "Creamy white, nearly covered with red, with a dark crimson cheek. Flesh fine grained, juicy, vinous, sweet; quality very good; freestone; usual maturity, in Middle Georgia, June 15th, and immediately following Alexander. Specimens received July 4th, 1885. Matures in Michigan, August 15th."

PEARS.

Earlis Birgamont (misprinted Early Birgamont in former report) was examined and reported by this committee at the Philadelphia meeting, two years since; but as the specimens were not yet mature, they were reserved for a further examination at maturity. This was done on September 25th, when a tendency to early decay at the core was manifested. No further addition to the committee's report seemed needful.

Seedling No. 1—from D. W. Lathrop, West Medford, Mass., was also reported at that meeting; and, on account of its immature condition, was re examined on September 25th, when it had commenced to decay at the core. Fresh specimens were received and examined, September 24th, 1885, when they were yet in perfect condition, having been picked September 13th. It fully sustains the committee's report.

STRAWBERRIES.

Park Beauty—fruited on plants received from the originator, cannot be distinguished, in either plant or fruit, from Crescent. Ripe June 16th, 1885. Pistillate.

Jumbo—ripened June 19th, 1885, and is, to all appearance, in both plant and fruit, identical with Cumberland. Bisexual.

SEEDLING, No. 1—Fruiting on plants received from R. D. McGeehan, Atlantic, Iowa, is very much like Wilson—certainly no better. Bisexual.

Parry—plants received from the originator in August, 1884, ripened a fine crop of fruit, June 19th, 1885. Specimens very large, beautiful, and of fine quality. It may be set down as an admirable family berry; and also well adapted to the market, if the plant shall prove sufficiently vigorous and productive Bisexual.

Jewell—fruited this season, on plants from the originator; ripening June 26th, 1885; it appeared to be exceedingly productive. The fruits are very large, and hold their size well through the season. It is barely medium in quality. The plant seems to be vigorous and healthy. Pistillate.

Cornelia—ripened its first perfect specimens, June 26th, 1885, on plants received from the originator, in the spring of 1884. It hardly equals Jewell, in productiveness; but the fruits are of large size, firm, and of very good quality. It will doubtless handle well, and its lateness will probably add to its value. Pistillate.

No. 6, unnamed—Plants of this were received from Mr. Crawford, Cuyahoga Falls, Ohio, in spring of 1884; fruiting the past summer. First fruits ripened June 27th, 1885; nearly or quite as large as Cornelia, of similar character, and even later, we regard it as highly promising. Pistillate.

Unnamed Seedling—discovered in the forest, by Mr. Collins, of Allegan County, Michigan, was removed to his garden, in 1883, where it has now fruited two years. Stems of the fruit, (both ripe and unripe) were sent to me, very indifferently packed, July 1st, 1885, which gave evidence of great productiveness; while the size was large, roundish, conical, clear, bright crimson. It may lack firmness. Flavor sprightly subacid, rather rich. Bisexual.

All of which is respectfully submitted.

T. T. LYON.

REPORT ON FOREIGN FRUITS.

Mr. George Ellwanger, Chairman of the Committee on Foreign Fruits reported verbally that a large number of imported varieties had been fruited during the past six or eight years but that none of them had come up to the required standard for record in our transactions.

T. T. Lyon, Vice-President for Michigan was called to the chair, and Mr. P. Barry read reports of the Chairman of the Committee on Revision of the Fruit Catalogue; also the report of the Chairman of the General Fruit Committee. Mr. W. C. Barry, the chairman of these committees was unable to be present on account of ill-health. The reports were received and pending further action: On motion of Mr. P. Barry they were referred back to the committees for the purpose of making such additions as it is desirable up to the time of publication. These reports will appear in full, later in this volume.

Upon Mr. Barry's resumption of the chair, on motion of T. T. Lyon the title of the Committee on Synonyms and rejected fruits, was changed to Committee on Nomenclature.

The hour having arrived for the address of President Wilder, in his absence it was read by Secretary W. J. Beal.

Address by the Hon. Marshall P. Wilder, Ph. D., L. L. D.

Gentlemen of the American Pomological Society:

With the close of this meeting of our Association, thirty-seven years will have elapsed since its organization. Thanks to the goodness of an overruling Providence, it still lives to dispense its blessings on mankind. Long may it go on prospering and to prosper, while the earth bears a fruit, or man lives to cultivate it.

I have several times tendered my resignation as President, but the Society has as often declined to accept it, and has elected a special officer to occupy the chair when from any cause I might not be able to be present. This action I take to be an expression of feeling that I should still remain with you by official relation, not so much for what I can now do, as for a testimonial of regard for what I have done in the past. So believing, I have the pleasure to address you again.

Happy should I be if I could meet with you, to express personally our gratitude to the Michigan Horticultural Society for its cordial reception, and the ample accommodations it has provided for us; and most happy should I be to exchange congratulations on the continuance of our lives; to rejoice with you in the prosperity of our Association, and to concert measures for its usefulness in advancing the great work that has been committed to our charge; but as this cannot be, I console myself with the hope that you will accept the invitation of the Massachusetts Horticultural Society, and come to Boston in 1887, when I may be permitted to lay off the robes of office with which you have so long honored me, unless, ere that time, I shall have been clothed with the robes of immortality, and gone up to gather celestial fruits, which ripen not in earthly climes.

The work which our Society assumed was great indeed—no less than to compare fruits, and opinions as to the value of the numerous varieties in cultivation; to assist in determining the synonymes by which they were known; to endeavor to abridge, by general consent, the long catalogue of indifferent or worthless sorts then propagated by nurserymen and cultivators; to furnish reliable information in regard to the varieties which succeed in our varied climates; to maintain a spirit of cordial intercourse with kindred institutions—in short, to extend and improve the culture of fruit throughout our land. Thus our Society became the herald and guardian of a new era in the progress of Pomology never before known in this or other lands. It was its mission to lead in this most beneficent work. Most faithfully has it executed this trust, embracing, as it now does in its organization, not only the States and Territories of our Union, but the British provinces on the north, all of which are represented in our institution, thus constituting, as it were, a Continental Association, working together harmoniously for the advancement of the Pomology of the American continent. Most of those who stood as sponsors at the organization of our Society, have exchanged the cultivation of fruits for the culture of the soul in the better land, and we fondly trust are now partaking of those immortal fruits whose bloom was on earth, but whose harvest is eternal in heaven. The Downings, Brinckle, Prince, Buist, James, Ernst, Warder, Walker, French, Cabot, and our Secretaries, Vick, Elliott, and Flagg, have passed on, leaving bright examples of their interest in our Society and the objects it seeks to promote. But, while we thus speak, let us be thankful to the Giver of all Good that some of its founders, who rocked the cradle of its infancy, still live and stand as its god-fathers to this day to receive the thanks of grateful millions. Thomas, Parsons, Hovey, Ellwanger, Barry, Robert Manning, still live to help us carry on our noble work.

IN MEMORIAM.

In reviewing events since our last meeting, I feel that we should most gratefully recognize that Divine Goodness which has preserved the lives of so many of our members to the present time. *Some few*—only a few—from our large membership have passed away, and only one, so

far as we know, of the more than one hundred connected with us by official relations, has departed since our last session, two years ago.

But he whom we could least spare has been taken from us. Charles Downing, our beloved friend, the upright man, and the great pomologist of America, is no more! The loss to our country and cause seems now to be irreparable. But Infinite Wisdom cannot err, and we should be thankful that he has been so long spared to us.

Mr. Downing was born at Newburg, N. Y., July 9, 1802, and died at his home in that city January 18, 1885. His death is to me a most afflictive event. We were associated together for nearly half a century in efforts to advance the pomology of our country. Succeeding, as he did, his brother, A. J. Downing, whose eulogy it was my sad duty to pronounce thirty-two years ago, he became the editor of the "Fruits and Fruit Trees of America," all the editions of which have been dedicated to my name from the first. These circumstances have drawn us more and more closely together by the ties of affection and friendly regard.

As a pomologist, he was world-renowned for his knowledge, accuracy, and good judgment, and as such had a longer experience than any other man of whom I have any record in this or any other country. His books will ever be precious memorials of good fruits and good men; of a life whose great object was to make others happy in the enjoyment of the beauties and bounties of creation, and which has been a blessing to our world.

For more than a generation, he edited the "Fruits and Fruit Trees of America," first written by his brother forty years ago. With the progress and expansion of pomology, this work grew under his hand to such an extent that he might well have claimed to be the author; yet, with characteristic modesty, he preferred to lay his laurels upon his brother's grave. This encyclopædic work, in its many successive editions, is now the authority in regard to the multitude of fruits described in it.

Charles Downing is dead, but his spirit is still with us, and will continue to inspire our souls, and the souls of those who succeed us, as long as a love of the beautiful in nature, of rural pleasures and of domestic comfort shall have a place in the heart of mankind. His star has now set, but it has left a golden record which shall bring forth the fruits which he so much loved. His works are a rich legacy to the American people, and an enduring monument to his memory.

Although it has not been our custom to refer to the decease of members who had not been officially connected with us, I cannot refrain from expressing the deep regret which has been generally felt on account of the deaths of two of our members who held the highest positions in the Horticultural Societies of Pennsylvania and Massachusetts, whose hospitalities we have several times enjoyed.

Hon. W. L. Schaffer had for seventeen years held the office of President of the Pennsylvania Horticultural Society, and had been still longer in other official positions. He was much devoted to the interests of that Society, and the advancement of our cause.

Hon. Francis B. Hayes was in the fifth year of his Presidency of the Massachusetts Horticultural Society. He was much interested in Horticulture, especially in the introduction of new shrubs and plants for the adornment of his country residence, expending large sums of money for this object, and was one of the largest and most constant contributors to the exhibitions of the Society over which he so ably presided.

Both of these gentlemen were taken from us last year; they will long be remembered for their love of Horticulture, and their labors in promoting it, and will long be mourned, not only by their respective Societies, but by those of this Society who remember them as presiding with dignity and grace at the banquets given to us on our last visits to Boston and Philadelphia.

WHAT OUR SOCIETY HAS ACCOMPLISHED.

When we reflect on the unsettled and chaotic condition of pomology in our country when our Society was established, the narrow limits to which fruit culture was confined, and the few engaged in it, and compare it with the immense territory now occupied for this purpose, and its importance as a great industry of our country, I think it may be well to take a retrospective view and see what our Society has accomplished.

Its formation opened a new era of enterprise in the annals of American Pomology, which has

no parallel in those of other lands. It was the first great national pomological society, embracing in its organization the largest area for fruit culture in the world, where almost every fruit of every zone may be grown in perfection.

It has brought into close communion of interest, and concert of action, the most experienced and skilful pomologists of our country; and by its proceedings and publications has furnished examples and methods of work which have been adopted by other pomological and horticultural societies, all working harmoniously together, and thus has become the acknowledged pomological authority of our land.

It is truly an AMERICAN Society, having, through all the vicissitudes of the past, held in the bonds of friendly intercourse for the promotion of our cause, the North, East, West and the South, and every region where fruits can be grown on this continent.

It has raised the standard of excellence by which our fruits are judged, discouraged the cultivation of inferior sorts, and thus educated the taste of the public for those of better quality, so that kinds once common in our markets have become obsolete, and are now considered unworthy of propagation. In doing this portion of its work it has discarded by general consent more than six hundred varieties, either worthless or superseded by better sorts.

It has established a uniform system of rules, by which fruits are to be shown and judged. But, what is of the highest importance, it has instituted a much needed reform in the nomenclature of fruits, by which all long, unpronounceable, indelicate, inappropriate, and superfluous words are to be suppressed in the dedication of our fruits.

One of the grandest achievements of the Society is its Catalogue of Fruits, published biennially, with isothermal divisions and columns for fifty States, Territories and districts, in which are recorded the fruits which may successfully be grown in those divisions, with stars to designate the merits and seasons of each. This is a work of great merit, and not attempted by any other society. And here let me say, that we should never forget how large a debt of gratitude we owe to Mr. P. Barry, as Chairman of the General Fruit Committee, for its compilation and classification. He has performed this duty for a long course of years; and fortunate indeed is it that we have, as his successor, his son, Mr. W. C. Barry, who has been so well educated for this duty.

Few things in the history and progress of American Pomology have been more effective in the past and was more promising of valuable results in the future than our system of State reports. They embrace correct information from trustworthy persons, having special reference to the varieties most successfully grown; new kinds worthy of special notice; the chief obstacles to successful fruit culture in each district; and correct information in regard to the extent and progress of fruit culture in each section of our country, and are published under the supervision of the chairman of the General Fruit Committee of our Society, and contain a vast fund of information not elsewhere to be found.

These reports constitute a mine of pomological wealth, and contain not only all the modifications and changes which may have been made in collecting information concerning the *culture* of fruits, but also in the *naming* of them, and the synonymes by which they are known; the most desirable varieties being designated in our catalogue by stars, according to their several merits.

I cannot close my remarks on this subject without expressing the very great interest I feel in continuing this most important branch of our researches through generations to come, so that for all times we may have a system for the advancement of pomology, which shall be worthy of our nation and the great interests we represent. Had it done nothing else, this alone would entitle our Society to the universal approval which it now receives, and the gratitude of the generations which are to succeed us.

Before the organization of the Society, while we had around us, an immense region ready for the cultivation of the finest fruits, great confusion prevailed in nomenclature, and the difference between good and bad sorts was very dimly appreciated. At that time, pomologists experienced great difficulty in obtaining varieties true to name; and sometimes, after repeatedly procuring fruits, and losing years in waiting for them to bear, found themselves where they started. The American Pomological Society has performed an immense labor through its meetings and its committees, in correcting this con-

fusion, and it is wonderful to contrast the early condition of pomology with its present mature state. Its future labor will be continuous and of vital moment, in introducing new and valuable varieties; and what will be of the greatest importance, maintaining an accurate nomenclature. It will inform fruit-growers, in every State and Territory, what fruits they are to look to for successful culture. But most important of all, its business will be *to give American Pomology a high character as a science;* to prevent the appearance of mere money-making and petty attempts to impart undue prominence to new favorites by laudatory names. The continued aim of the Society will be to maintain a position of dignity, integrity, and impartial usefulness.

To record all the good the American Pomolgical Society has accomplished would be equivalent to writing the history of American Pomology during the period of the Society's existence. Its proceedings are not only a record of the events of the time, but they clearly show that the Society has been pre-eminently instrumental in shaping and directing the pomological destinies of our continent. It has organized and systematized everything pertaining to fruit culture, and has developed and elevated American Pomology. The Fruit Catalogue is a grand and glorious work, but far greater is the educational and refining influence which the Society exerts over its members. No one—unless he be irredeemably depraved,—could attend its meetings without becoming not only a better pomologist, but also a better man and Christian.

The work which our Society assumed was immense. It required a great Society to carry it out. A great amount of time, labor, and treasure has been expended in bringing it to its present flourishing condition; but however great the labors performed, and the sacrifices made in behalf of our Society, not one regrets them, but all rejoice that they have had a share in promoting a work so beneficent in its design, and in perpetuating it for the comfort and happiness of mankind.

That the Society's mission for the future will be not less beneficial is hardly to be doubted, built upon so solid a foundation as it is. It will continue and complete the reform in nomenclature just commenced. As the laws that govern cross-fertilization become better and better understood, it is not improbable that the most desirable types and strains of fruits will become more firmly established, resulting in the diminution of the number of varieties, and the perpetuation of only those best adapted to our various climates and soils. The special aim of the Society should be to enlist in its active membership all the best elements of our country, and to form, as far as possible, a closer relation with all existing State Pomological or Fruit Growers' Societies.

RULES OF POMOLOGY.

Nothing has afforded me more gratification than the favor with which our rules of Pomology and the reform in the nomenclature of our fruits have been received.

Soon after the close of our last session, we sent out a thousand circulars containing these rules, together with the suggestions of the president in regard to the much needed reform in the nomenclature of fruits. These were sent to the Agricultural, Horticultural, and Fruit Growers' Associations, and to the leading nurserymen of our country. Some were also sent to foreign lands. The favor with which these have been received both at home and abroad has been remarkable, showing that the time had arrived when, by general consent, this reform should be made; and thus our Society has the honor of instituting it as an example for the pomological world. When we reflect on the long, senseless, and sometimes vulgar and ridiculous names by which so many of our most beautiful fruits are known, our indignation is so aroused that we desire to blot them from our memory forever. Some have thought this spirit might be too aggressive. All reforms are more or less so; but when we think of the irrelevant and inappropriate names by which many of our fruits are known, we feel the importance of keeping up our warfare until the victory is won, and all our catalogues are purged of these improprieties. As I before felt, I still feel it my duty, as President of the American Pomological Society, to urge a reform in the names of fruits, avoiding all long, superfluous, inappropriate, indelicate, ostentatious, or unmeaning titles, and if we cannot change objectionable names already applied, at least to avoid them in the future. Hundreds of fruits once known in our catalogues have

become obsolete for want of good properties, and so it will be in the future, and we shall retain only those which, by their excellent quality and adaptation to our situation and wants, are worthy of extensive cultivation. Like the Baldwin apple, the Bartlett pear, the Concord grape, and other renowned fruits, let such varieties be dedicated to perpetual remembrance by appropriate names, and thus let us hand down to future generations a system of nomenclature pure and plain in its diction, pertinent and proper in its application, and which shall be an example, not only for fruits, but for other products of the earth. Let us have no more names of generals, colonels, captains, presidents, governors, monarchs, kings or princes, mammoths or Tom Thumbs, or such titles as Nonsuch, Seek-no-further, Ne-plus-ultra, Hog-pen, Sheepnose, Big Bob, Ironclad, Legal Tender, Sucker State, or Stump-the-World. There were suggestions made in my last address, to which I still adhere and from which I have nothing to take back. The terms Pearmain, Pippin, Beurre, Doyenne, Bon Chretien, etc., applied to apples and pears, once described classes of fruit which are now so confused and blended that the names have lost their significance. The cases are very few where a single word will not form a better name for a fruit than two or more. These reforms have been adopted in the Catalogue of the American Pomological Society, and other prominent horticultural and pomological societies have voted to adopt the improved nomenclature, and I desire to ask the co-operation of all pomological and horticultural societies in this and other countries in carrying out this important reform. It has been suggested that the work might be carried farther than has been done in the catalogue of the Pomological Society, as, for instance, by substituting Lucrative for Belle Lucrative, and Nelis for Winter Nelis. Pomologists may differ as to how far the reform should be carried, but by comparison of views they will come to a final agreement.

I desire especially to enforce upon nurserymen the duty of aiding in this reform, by revising their catalogues so as to correspond with the improved nomenclature. Horticultural and pomological associations have thus far been our most powerful auxiliaries in this good work, but they do not come in contact with the people at so many points as the nurserymen whose catalogues are distributed broadcast over the land, and I would especially appeal to the many honorable representatives of this profession here assembled, to give us their hearty co-operation until the work is accomplished. Let us push on constantly and vigorously while we live, that future generations, seeing its advantages, shall avoid the evils we have encountered, and shall enjoy the benefits of the improved system, and look back with gratitude to us for our labors.

PRODUCTION OF NEW FRUITS.

And now in fulfilment of my promise to urge upon you while I live, the importance of producing from seed, new improved varieties of fruits, adapted to the various soils and climates of our vast territory, I have substantially to repeat what I have said in my former addresses. These are the means, and the only means, which God and nature have provided for the improvement of our fruits, and the better we understand and practice them the nearer shall we approach to that divine beneficence which gves flavor and richness to our fruits, and to the senses the highest types of beauty, grace, and gratification.

Thus from time to time I have spoken to you, and, were these my last words, I would again impress them upon you as of the utmost importance. With a careful study of the tendencies of varieties, and a judicious selection of parents, as breeders, we shall go on to produce fruits which will be adapted to every climate or condition of our land where any species of fruit may be grown. When we see what nature has done without the aid of manipulation—in the cold regions of the north, as in Russia, from whence came the Oldenburg and Tetofsky apples, the Black Tartarian cherry, and other good fruits, as seen by Professor Budd and Mr. Charles Gibb, who can doubt our ability to produce fine fruits even in the colder regions of our country?

When we consider that the art of crossing varieties for their improvement was scarcely known until our day, and see what wonders have been accomplished by it, who can doubt that we may yet produce a pear with the richness of the Seckel, the form and size of the Bosc, and the vigor and productiveness of the Boussock. And so we may go on to improve other fruits, until all shall be made as perfect as ever were grown

by "the grand old gardener" in Eden. But to do this we must study the characteristics of varieties, and thus help nature to perfect this work.

Thus Providence has placed in the hands of man, a power to assist nature in the production of her most perfect and beautiful creations. And whatever some may think of variations, evolution, transmutation, or transformation of species, the great fundamental laws of life and its reproduction will remain unchangeable and immutable as long as the earth bears a plant, or a tree yields a fruit, or nature holds her place in the universe.

Nature is a kind handmaid, and, by her lovely creations, is constantly inviting us to come up and assist in her glorious conquests. Her voice is heard throughout the earth. To us, she says: "Come up and sit with me, and you shall have plenty and perfection. Come, and I will give you fruits which shall delight the eye, gratify the taste, and satisfy your souls."

O! Yes! Thou Queen of Grace,
We'll come and take thee at thy word:
We'll take thee, Nature, as a bride,
And, hand in hand and side by side,
Our loves and labors we will join,
And bless the hand that gives us thine.

We have now many excellent varieties of fruits from foreign lands which are suited to many of the soils, and climate of our country. But when we reflect upon the number that have proved worthless, and are not suited to our condition, and consider the large number of good American sorts that have already been raised, we are forced to the conclusion that we must, hereafter, rely mainly on the production of new varieties from seed, to supply the necessary kinds for our constantly increasing territory for fruit culture. We therefore rejoice in the great interest which has been awakened in this subject, so that what was a few years ago considered by physiologists and philosophers a mysterious art or science, is now practised extensively by cultivators in the various families of vegetable life. And now that we have the knowledge of this art, there is no limit to its use for the improvements we may desire. And, strange as it may seem that the knowledge of this process of helping nature was withheld from us until our day, it is capable of indefinite application as long as the sexes of plants shall be known, and is the only means to revolutionize and improve the fruits of the earth.

When we reflect on the improvement which has been realized by cross-fertilization in the various species of the vegetable kingdom, we can scarcely fix a limit to its potent influence for good on our fruits. And we may thus go on from one degree of excellence to another until we shall produce fruits as fine as were ever grown by our father in Eden. Go on prospering and to prosper in this most promising and beneficent work. You can do nothing better for the generations that are to follow us; and so again, with line upon line, and perhaps for the last time, I leave with you my old injunction: "*Plant the most mature and perfect seeds of the most hardy, vigorous, and valuable varieties; and as a shorter process, insuring more certain and happy results, cross and hybridize our finest kinds for still greater excellence.*" Go on! Go on! while you live, and when we are gone, others will rise up to chant our old song:—

Plant the best seeds of all your best fruit,
Good fruits to raise that some lands may suit;
Fruits which shall live their blessings to shed,
On millions of souls when you shall be dead.

Plant! plant your best seeds—no longer doubt
That beautiful fruits you may create;
Fruits which, perchance, your name may enshrine,
In emblems of life and beauty to shine.

Thus have I summed up some of the most important considerations and suggestions of my former addresses, thinking that I could do nothing better than to call your attention to them again, and re-enforce them as principles upon which must depend the successful prosecution of our work.

And now, gentlemen, in conclusion, let me again congratulate you on what our Society has already accomplished. "The past is secure"; but the great duty still remains of extending, fostering, and rightly directing the pomology of our country.

Other societies have arisen, and will continue to arise, and help forward our noble designs; but the American Pomological Society will still bring together the most distinguished cultivators of our land, and will be the great head, guardian, and guide of the pomology of this western world. When we reflect on what has been ac-

complished in the thirty-seven years of its history, and think of the immense territory in our favored land which is yet to be occupied with fruit culture, and of the increased demand for these products so necessary for the health and happiness of life, we feel the great responsibility which rests on us as protectors and conservators of one of the most important branches of American husbandry. Let me then urge you to persevere in this work and preserve our bond of union throughout the land. "Union is strength"; and in nothing is this better illustrated than in the associated efforts which have given such influence and importance to our Society. Perpetuate it, that the blessings which it confers may go down to posterity, and grateful millions shall bless the memory of those who laid its foundations, and shall aid in carrying out its benevolent designs. Think once more, my friends, of the great blessings which you may confer on mankind by the multiplication of good fruits. Next to saving the soul, is the saving of health, and I know of no better means than an abundant supply of ripe fruits.

Fruits are the overflow of nature's bounty; gems from the skies which are dropped down to beautify the earth, charm the sight, gratify the taste, and minister to the enjoyment of life; and the more we realize this, the more shall we appreciate the Divine goodness to us, and the duty of providing them for others.

> Like morning's first light, that gladdens the sight,
> So may the best fruits spread over the earth.
> And when we shall reach that still fairer land,
> And round the life-tree in mercy shall stand,
> May each pluck its fruit, and nevermore feel
> The serpent's sharp tooth, once close at his heel.

At the close of the reading of the address, on motion of P. M. Augur, of Connecticut, the thanks of the Society were tendered to President Wilder for his most interesting and profitable address, and the Secretary was authorized to send him, from the Society, a telegram of congratulation.

DISCUSSION ON NEW FRUITS.

APPLES.

Yellow Transparent.—Peter M. Gideon, Minnesota: It is of Russian origin, and not quite hardy in Minnesota. It is about the same in hardiness as the Oldenburg which has always proved hardy until the past winter.

Chas. A. Green, New York: It is fruiting with me this year, and is fair in appearance, and better in quality than Early Harvest.

H. A. Chase, Pennsylvania: During the past season I have received reports from several hundred parties in our Eastern States who have fruited it, and I think that without exception they all found it earlier than the Early Harvest. They seem to regard it as one of our coming early market sorts.

Chas. Gibb, Quebec: It is a very promising apple in our province; is an early bearer, and ripens ten days before any other variety we have.

J. L. Budd, Iowa: We have fruited it several years; it is about as hardy as the Oldenburg, and nearly two weeks earlier than the Red Astrachan; it is a relatively light bearer, and the fruit is not as uniform in size as the Oldenburg.

Wm. Parry, N. J.: An early bearer; good size; superior to Early Harvest.

J. S. Woodward, N. Y.: Is it not liable to crack and become too mellow?

J. L. Budd, Iowa: I have seen no special tendency of that kind until it became over ripe. In looking back over the English horticultural works I find that this apple was introduced into England from Russia in 1827, about the time of the Oldenburg, and received the name, Sugar Loaf Pippin.

The Dickenson.—W. H. Moon, Pennsylvania: This apple was illustrated in the last Pennsylvania Horticultural Report; it is a fair red apple of good size.

Howard A. Chase, Pennsylvania: My attention was called to it some years ago by Josiah Hoopes; it is a seedling of Yellow Bellflower, raised by Mr. Dickenson, of Westchester, Pennsylvania; it ripens about with the Bellflower; color a yellowish green, covered with stripes and splashes of red; quality about like Bellflower. Mr. Hoopes is quite enthusiastic over this apple, regarding it very promising for his locality. It is a reasonably good grower; habit somewhat like Bellflower, and should go on the list.

Chas. A. Green, N. Y., called up an apple sent from Arkansas and known as the

Shannon.—J. C. Ratliff, Ind.: It is the best

winter apple for Arkansas, and is supposed to have originated in that State.

S. Hape, Ga.: I saw the Shannon apple at the New Orleans Exposition last winter, and it was exceedingly fine in appearance and of very good quality. I believe that the State of Arkansas took the premium on apples mainly because of its beautiful exhibit of this variety. I am told that it is a shy bearer and only adapted to the mountain regions of Arkansas.

T. T. Lyon, Mich.: It is a very fine looking apple, of not very good quality. I think it would be very good to sell. It is somewhat the color of Peck's Pleasant. It is a little more oblong than that apple, and seldom, if ever, has a red cheek. As to quality, all the apples at the South are so mild compared with the same varieties at the North, that the latitude may have affected the quality as we saw it there. It seemed to take a high position with fruit men at the Exposition, but was spoken of rather as a market fruit than for its quality.

Cellent.—Charles Gibb, Quebec: It is a Scotch apple. Near Montreal it is a very good apple, not as heavy a bearer nor as early as Yellow Transparent, still a good bearer, hardy, of good size and fair quality.

J. L. Budd, Iowa: My opinion is that it is a Polish apple, as we have imported it from Poland. I think it fully as hardy as Fameuse, and perhaps more. It is large, rather showy, and ripens in late fall or early winter. It is not an iron-clad unless Fameuse may be so-called.

Glast.—P. M. Augur, of Connecticut, asked if anyone knew of this apple. He had received cions of it from the Department of Agriculture. It is said to be a beautiful brownish red apple, excellent for baking.

J. L. Budd, Iowa: Our experimenting has not been with the Department list. That list contains a great number of German apples, and those from near the Baltic where the climate is not like America.

Charloten Thayler.—J. L. Budd: This is of the Yellow Transparent class, a little later, and and probably a little larger, and many of our people think a little better grower in the nursery.

Charles Gibb: It is eatable with us about July 25. This year it was about three days later; an earlier market variety which can hardly be distinguished from the Yellow Transparent.

Prof. Budd: It is a few days later than the Yellow Transparent.

T. T. Lyon: At New Orleans last winter there was shown from Wisconsin a large and very beautiful seedling of the Alexander, called

Wolf River.—J. L. Budd: It has most of the habits of the Alexander. In our Western climate it is inclined to blight like all of the Aport type. It is not as hardy as ths Oldenburg and has most of the faults of the Aport family. I do not know of an Aport that is exempt from blight to quite an injurious extent.

P. M. Gideon, Minnesota: It has proved somewhat tender in our State.

P. M. Augur, Connecticut: It struck me at New Orleans as being one of the most beautiful apples on exhibition.

Prof. Budd: It is at least 30 per cent. hardier than Fameuse.

Gideon.—P. M. Gideon, Minnesota: This is from the seed of a seedling crab about the size of the Transcendent, which stood in an orchard surrounded by Blue Pearmains in blossom at the same time. The tree resembles the Blue Pearmain. We grew 500 seedlings, but only about twenty proved hardy, and none of them were of any value except those from trees near the Blue Pearmain. All were from crab seed, or supposed to be crossed with crab.

Excelsior.—P. M. Gideon, Minnesota: This is from the seed of the Wealthy, and may contain a cross of the Cherry Crab or the Oldenburg. It is a little larger than the Wealthy, of equal quality, is more hardy, and a good bearer. We consider it safe to plant as far north as anything we grow.

Peter Coller, of Michigan, asked about the

Salome.—J. L. Budd: It is being tested in Iowa by one of our best men who believes it valuable. It originated on Illinois river with Mr. Hathaway. I have been watching it for eighteen years. It is a good keeper and grower. It is fairly hardy—not as hardy as Fameuse, but more hardy than Ben Davis—small size, very good quality. It's season in Central Iowa is January to March. It is not hardier than Pewaukee. It is of better quality than Ben Davis, but not as large—not larger than a well grown Winesap.

Hog Island Sweet.—J. J. Robinson, Michigan: It ripens in October.

CHAS. A. GREEN, New York: Mr. Downing sent me cions of it several years ago, recommending it highly.

MR. ROBINSON: It is a good bearer, a little larger than medium size when not overbearing, and is one of the best for dessert. It will keep till Christmas. It is quite deep red on the sunny side and yellowish on the other. It bears every year.

B. HATHAWAY, Michigan: It is not hardy with me, but of excellent quality, and one of the best of sweet apples for its season.

McMahon's White.—A. E. GIPSON, Colorado: I see that this apple has recently taken a prominent place in Wisconsin. It is spoken of as exceedingly hardy, and has recently been added to the preferred list for that State.

J. L. BUDD, Iowa: During July of this year, I spent two weeks in Wisconsin visiting the apple orchards. The McMahon's White is of the Aport class, and I think is not as hardy as Wolf River. We can call all apples of that class hardy, but have to class them with the Fameuse in hardiness. It is not as large as Wolf River, and more like the Northern Spy in shape. It is of the Alexander class, but not of the same color.

A. E. GIPSON: It was sent out by Freber & Hatch, of Richmond, Wis., who have been experimenting with apples from Northeastern Europe.

R. MORRILL, Michigan, called attention to an apple in his orchard like the Northern Spy in all respects except in being sweet. It was among Spy trees and supposed to be a Spy until a year or two ago. Similar cases were mentioned by others; they were considered seedlings.

Northwestern Greening.—T. T. LYON, Michigan: As exhibited at New Orleans it was very attractive in appearance but not very good quality, about as good as the Pennock. It is hardy.

J. L. BUDD, Iowa: I was very favorably impressed with its appearance at New Orleans. I liked the appearance of the foliage and wood as there shown. During the last month I called with Mr. Peffer, of Wisconsin, to see the original trees planted twelve years ago, within eighteen miles of Lake Michigan, west of Milwaukee. They were planted in an orchard with Fameuse, Talman Sweet, Pewaukee and others. The damage from the winter has not been as severe there as further west, and all of these varieties were in good condition except the Northwestern Greening; and out of eight trees of this variety only one is in good condition; hence it cannot be very hardy. It is conical in shape, and should not be called a Greening. It has a deep basin like Grimes' Golden and resembles that apple.

Kellogg Russet.—CHARLES GIBB, Quebec: It is grown by A. G. Tuttle, of Wisconsin. It is just like the Golden Russet of Western New York, but a more thrifty and a more hardy tree.

Mann.—E. MOODY, Lockport, N. Y.: We value it highly. It is always of fine shape, good size, and as far as I have known, hardy. Planted thirty or more years ago at Niles, Michigan, with other varieties, it is still in fine condition while the others are gone. Downing says it originated in Otsego County, N. Y. I have perhaps 1,000 trees in orchard of this apple just coming into bearing. It is a fine grower. It is somewhat conical, green in color with a light flesh, always fair, of good quality and keeps exceedingly well. It sells well in Europe. Mr. Parmelee, of Old Mission, Michigan, sent them to Scotland a few years ago and received a net price of six dollars a barrel. I have known them to sell in New York city at five dollars a barrel when other varieties in good condition brought but three dollars.

C. T. ROSENCRANS, Michigan: I have a few trees and they are more hardy than Baldwin.

C. L. HOAG, New York: I have grown the Mann apple for twenty-five or thirty years. The tree is very spreading when in bearing. The apple is covered with white specks and has a blue shade on the sunny side. The tree is liable to overbear and the apples to be small. If the fruit is thinned, it will be about the size of the Rhode Island. I keep it until June. Quality fair; better than Roxbury Russet. I never saw the Codling moth work on it.

MR. MOODY: Until it comes into bearing it is one of the most upright of growers. The Mann apple of Massachusetts has a tough skin.

P. M. AUGUR, Connecticut: How is it as a cooking apple in the spring?

MR. MOODY: It is the best we have at that season of the year, but not quite so tart as some earlier kinds.

PROF. BUDD: Our nurseries introduced it extensively, and it grew well until the last three winters, but I do not now know of a live tree in a nursery west of Lake Michigan, as far south as Waukegan, Ill. It has not stood as well as Ben Davis. I would like to ask Mr. Moody the difference between the Mann and the Virginia Greening.

MR. MOODY: They are distinct. The Mann is a seedling which originated in Otsego County, N. Y. I gave it the name, Mann, as it grew in an orchard among other seedlings of Mr. Mann. It differs from the Virginia Greening in flavor and growth of tree.

BENJAMIN HATHAWAY, Michigan: I had last fall two-year-old grafts of the Mann and the Red Canada in the tops of large trees. The Mann all stood, and the Red Canada killed half way back.

T. T. LYON, Michigan: I think it sufficiently hardy for Michigan, but not good to eat or cook, though it sells well.

MR. MOODY: Downing unfortunately classes it as very good.

MR. HATHAWAY: I think the Mann is worthy of some commendation. The Red Canada is failing in Southern Michigan, and we have to look out for something that will do better. For market purposes we must grow apples that we can grow in quantity, and that will sell.

J. S. WOODWARD, New York: When the Mann is fit to eat, the others are gone. It will keep longer than the Roxbury Russet.

MR. WOODMANSEE, Michigan: Is it as hardy in the third tier of the counties as the Northern Spy?

MR. LYON: I reply to Mr. Woodward: The Red Canada stays longest in market in the spring of any we have.

MR. HATHAWAY: In reply to Mr. Woodmansee: I cannot say, but the Northern Spy does not bear well with us, and does not sell as well as those grown farther north, hence we need a long keeper that will sell. The Mann stood last winter with us on Northern Spy stocks.

P. M. AUGUR, Connecticut: We have an apple in Connecticut much like the Mann called the

Coe's Greening.—It is an abundant bearer, smooth and handsome, of medium size, not of first quality but a good cooking apple; keeps till May or June.

Somerset.—C. L. HOAG, New York: As growing in Niagara County, it is a deep golden yellow, of the shape and size of the Black Gilliflower, and an enormous bearer on alternate years. A fine dessert apple.

Lon.—MR. GIPSON, Colorado: As I have it on my grounds it seems promising.

MR. GIDEON: It originated with me and is a seedling of the Oldenburg. It is ten days ealier than that apple, and earlier than the Tetofsky; quality first-class both for dessert and cooking.

Jacob's Sweet.—J. W. Manning, Massachusetts: It resembles the Sweet Bough, but has more blush on the side, and will keep till July 4th. It is described in the last Massachusetts Horticultural Report. It is not yet disseminated.

MR. ROSENCRANS asked concerning an apple said to keep better in Missouri than any apple from Michigan, called the

Missouri Genetting.—It was considered by T. T. Lyon and P. Barry to be Rawle's Genet.

G. RICHARDS, of Michigan, mentioned an apple grown on the Lake Shore, in Ohio, and known as the *Ohio Greening.*

P. M. AUGUR, Connecticut, mentioned a seedling which came up in the highway in that State. It's quality was very good, to best, with with a Pearmain flavor and a delicious aroma. Season April to May. The tree is yet young. It is called the *Bradley.*

MR. COLEMAN, Commissioner of Agriculture, called attention to

Wright's Genetting.—It is an apple so named by Dr. Warder from specimens sent him by Mr. Coleman two or three years ago. They somewhat resemble Rawle's Genet, but differ in quality, and especially in the growth of the tree; it being larger and the apples not being in clusters like Rawle's Genet. I saw the original tree in the orchard of Mr. Wright, and he told me it was the most profitable tree in his orchard. It is an annual bearer as the Rawle's Genet is not, but probably would not succeed in Michigan.

MR. LYON: Rawle's Genet succeeds here. I would like to ask Mr. Coleman about the

Misouri Pippin.—MR. COLEMAN: It originated in Lafayette County, Ohio. It is an early bearer and very productive, and in its locality is being extensively grown.

Mr. Barry: The Missouri Pippin is starred for Kansas.

P. M. Augur: It was one of the most beautiful apples on exhibition at New Orleans.

J. L. Budd: There is a variety of the Russian apples that has been widely fruited that has many desirable qualities for parts of the country where we need something hardy, called the *Longfield*.

Notwithstanding the past three cold winters in succession it has each year been loaded with fruit besides making a growth of sixteen to eighteen inches. It is larger than Jonathan, about the weight of an ordinary Missouri Geneting, but not the same shape. It is yellow, with a flush like the Maiden's Blush in the sun. Keeps through the winter. Quality as good as Fameuse and somewhat like it. It originated at Sarepta on the Baltic, hence is not as hardy as some. It is adapted to about the 42d parallel, the Jonathan being adapted to about the 43d. It keeps better than Fameuse.

CRABS.

Whitney's No. 20.—Charles Gibb, Quebec: I fruited twenty-seven varieties of crabs this season and consider this the best. Texture of the flesh just as it becomes mellow is the only thing indicating Siberian blood.

Early Strawberry.—Mr. Gibb: Ripens with Red Astrachan apple. It is of small size but nothing that I grow equals it in quality. It has no astringency.

Gibb.—Mr. Gibb: This is a seedling originated by Mr. Peffer, of Pewaukee, Wisconsin, and so named by him, and is noted in the special list of best crabs for that State in the last Wisconsin Horticultural Report.

A discussion then followed on the uses of crabs for culinary purposes, and for the purpose of originating hardy apples.

The following paper was presented by the Secretary, the author not being present:

THE CAUSES THAT PRODUCE COLORS IN FRUITS, AND THEIR DESIGN IN NATURE.

BY

Joseph H. Bourn, of Providence, R. I.

The tints displayed in the brilliant colored fruits, convey to the mind a sense of the richness and vastness of nature's resources, where exists an innate tendency to variation and change, the key note of evolution. Fruits exhibit definite hues, often varying from species to species more or less closely related to the habits and functions of the tree, shrub or vine; and while affected in their environment, the manifold shades of the different colors, often vague and indefinite, must be an attribute of light produced by the sun's influences, and not a quality of visible objects, having no existence apart from ourselves, the color to the eye being much the same that music is to the ear. The complex laws and unexpected relations involved in the production of special hues in the fruits then, excites an additional interest, since each style of coloration has a meaning and a use, and adds a new charm to the study of nature, exciting emotions above the level of a world developed in utilitarian principles.

In the investigation of our subject, let us consider what is color when seen objectively; the causes which aid in producing the colors in fruits; the design in nature, which makes useful the tinted coating of fruits; and if a law of relation exists between the color of the flesh of fruits, and the flavor.

Color viewed objectively consists in the different rapidity and wave length of various etherial undulations, in their totality called light; in their several component parts, color. Inorganic bodies as we find them are dull browns, dingy grays or impure whites; but in the organic world we find abundant pure colors, or other waves of single or slightly compounded orders. Most objects have their molecules so set, as to absorb certain amounts of other waves and return certain other orders. The latter we generally speak of as colored objects; and these are what make us linger so lovingly over the rich autumnal shades as displayed in the exquisite pink of the peach, pear, apple and mango, and the diverse artistic wealth, in their season, of oranges, cherries, plums, strawberries and pomegranates. Long before the first vision could discriminate between the red, yellow or blue, the various hues we call by those names poured down unnoticed upon the primeval world. Then, as now, the rainbow scattered its colors upon the dull gray clouds, but no eye drank in the diverse stimulation from

its gorgeous undertones of melting orange and exquisite green.

Previous to all perception of color by man or animals, color existed as an agency in the external universe. Then the prism had not become the key to the mystery of the rainbow: then was not known that the red, blue and yellow were the three strands that were wreathed together in the sunbeam.

Now the reflected light waves make us see things in different colors: and if they depend on the size of the waves which come back to us, then we must see things colored differently, according to the waves they send back. The red, orange, yellow and blue waves are all useful to the leaf of a cherry tree, and it does not release them; but it cannot absorb the green waves, and so it throws them back to the eye, and we see a green color. The leaf rejects the green waves of the sunbeam, and sends them to us. In the same manner, the red apple or peach refuses the red waves, the lemon or pear the yellow waves, while the cherry is like a small sun of red rays which it reflects on every side. The names of colors are only abstract words, which necessarily take their rise from a concrete, as when we speak of orange, cherry or apple green. There is really no such a quality as color in the currant, plum or strawberry, being a property inherent in light; but for some reason, because they send back only certain colored waves to our eye, we see them of varied hues. So we conclude, that all the beautiful tints and shades of every kind of fruit are the work of the tiny sun waves, wonderful airy messengers, as they travel eternally, unceasingly across space, never resting or tiring. We linger lovingly over the many shades of fruit, in the unselfish enjoyment of the rich and pure tints, so that one can hardly believe that the rays of light producing the green, yellow and pink differ only in wave-length and rate of vibration.

In the great forests of the carboniferous era, where the world was supposed to exist without a color-sense, we can find no evidence that any fruits diversified the unbroken green of the primeval world, or gleamed red or orange among the embowering foliage. The eye of an imaginary visitor must have rested on one unbroken sea of glistening verdure. No trace of vegetable organism has yet been discovered in the primary rocks, to which we can even conjecturally attribute a possible tinge of red, blue or yellow in the form of fruit. Scarlet berry and crimson blossom were equally absent from the unvaried panorama of green above and brown beneath. Such we may suppose was the general appearance of our earth's surface, before the color-sense had given rise to all the diverse wealth of hues which now gladden the orchard, the woodland and meadow. The periods of geological vegetation existed in the following order: plants like ferns and mosses which bear no fruit: pines and firs that have their seeds in dry scaly cones; and those enclosed in some more or less conspicuous form of enveloping fruit. Among the most ancient fruit-bearing plants that existed in the Cretaceous period, were the oaks, beeches and chestnuts, and it was not before the Miocene period, that the apple and plum tribes were known: and this transition from the wholly green and spore-bearing cryptogams to the bright hues of entomopholous flowers, must have been through the intermediate stage of anemophlous plants. An increase of color perception has doubtless taken place within the historical period, from which we must conclude, that the Archaic man had a positive perception only of light and darkness, and that in Homer's time, an imperfect discrimination of yellow and red existed, the green being never alluded to: not because the perception of color was then inferior to what it now is, but that there had been established no precise nomenclature of colors, as their names being abstractions, must have been a late development in language.

If we observe the different coloring matters which are found in the fruit tissues, their sensitiveness to light, the changes that take place during growth and development, and the ease with which new chemical combinations are effected by the physiological processes of plants, as manifested by the large variety in the chemical constitution of vegetable products, it will not be difficult to understand the causes which aid in producing colors. Probably the coloring substances differ only in the smallest particulars of chemical composition. Variable colors are seen in fruits, according to the state of oxygenation which their juices have reached, which changes have a definite relation to the various periods of maturity. We must reasonably infer

that the bright hues are due originally to the natural oxidation taking place in all purely expensive structures, aided by the selective action of insects. Chemical action is the most powerful cause of change of color, since it implies change of molecular form; but heat often causes the same without bringing to pass any chemical variation. During the physiological processes of development and growth, we do know that chemical changes are occurring under the influence of light and heat in many of the complex substances, which makes color a normal and even necessary result of the structure of fruit; and that those parts which are undergoing continual development and adaptation to new conditions, and constantly subject to the power of heat and light, are the same in which will be found the most frequent color variations. Influence of locality is also a cause of color changes, arising from the presence of peculiar elements or chemical compounds in the soil, the water, the atmosphere, or of special organic substances in the vegetation. The nature of plant food, the photographic action of light, as well as some unknown agency perhaps dependent upon chemical peculiarities in the earth, are causes which have an influence in rendering the bright tints to fruits.

The theory cannot be valid that the brilliant colors of fruits are due to the direct action of light. The ultimate source of all the energy existing in the vegetal organism, is owing to the solar radiations which fall upon the green portions of plants, under whose influences, the plant separates carbon and hydrogen from the oxygen with which they were originally combined, stores them up in some part of its own tissues, and turns the free oxygen adrift upon the atmosphere around. Thus we are to conclude, that fruits derive their energies, not directly from the solar undulations, but from the organized matter already existing in the soil. The green fruits assume tints at the time of their maturity when ready to be eaten, the change resulting from some degredation of energy, giving up the function of deoxidation as they begin to turn yellow. Similar effects result from disease and insect attacks producing a yellow or speckled surface caused by oxidation or some other de-energizing action. Frequently we observe that fruits which have laid aside their natural functions assume the bright hues. The least change in molecular constitution is liable to be accompanied by a decided change in color, and in the constituents or contents of plant tissues would produce many alterations in their color. It would be difficult to say, whether such hues are always due to oxidation, but it is certain that the same is going on in the tissues where the tints appear. The development of colors at maturity of fruit, seems as if related to extra oxidation modified by light, and other varying conditions not yet understood. All bright vegetable pigments except chlorophyll occur often where oxidation is taking place due to the absorption of oxygen or secondary results of that action, and present themselves wherever energy is being expended.

Fruits in their early stages contain green pigments, but as they mature gradually take on the yellow, blue, purple, red and orange shades, exhibiting varied hues according to the state of oxygenation which their juices have reached; and these differences bear a definite relation to the periods of maturity. The connection of these changes is marked, for in their early state, pulpy fruits have the structure and chemical composition of leaves, passing through the acid state slowly as they mature, and finally reaching that of ripening, when their gum, cellulose and acids are partially converted into sugar, accompanied by a loss of watery fluid, and an evolution of carbonic acid. This sugar is not the same in any two different species, and different perfumes are extracted as from the nectar in flowers; and it is this redolence that gives rise to the different flavors in fruits, often modified by climatic transitions.

The fruits proper display greater brilliant coloration than any other class of organic objects except entomophilous flowers. Among the cultivated varieties, are apples, plums, peaches, cherries, pears, grapes, strawberries, currants and raspberries; amongst the wild fruits are holly-berries, mistletoe, mountain ash, barberry, yew, ivy, iris, elder, saffron and blackberry; and amidst the tropical and sub-tropical climates, more gorgeous examples are supplied in the mangoes, lemons, star apples, pomegranates, bananas, nutmegs, dates, oranges and passion-flower berries. One of the most perfect effects in Nature is in the large fruit of the quince tree as it ripens yellower, hanging heavily by a thin brown stalk from its involved and tortuous

branches, shaded by its own downy green leaves, as if for the comfort of the fruit; and beautiful in mid-autumn is the fruit and foilage of the grape, when it takes on the most gorgeous coloring of purple, gold and scarlet. By the light of evolutionary biology, Mr. Sorby leads us to inquire, why do these fruits take particular hues, and affirms that the diversified pigments of the bright skin are already contained in the ordinary tissues of the plant, whose juices only need to be modified slightly in chemical constitution to make them into the blue, purple, red, crimson and amber shades; and believes that the colored substances in the rind are often the same as those in the foilage from which chlorophyll has disappeared as to resemble the autumn tints of yellow and green leaves. The development of of substances belonging to the erythophyll group then is the cause of color in many fruits whose various hues are stored away ready to be brought out momentarily in the tissues All fruits easily sport in color, due to no mere spontaneous accident, but in their inception to a regular law of progressive modification.

The great central color of most fruits before maturity is reached is green, whose product is only perfected in the presence of sunlight, and is composed principally of carbon and hydrogen with a small apportionment of nitrogen and oxygen. When the chlorophyll is formed from these elements, it is moulded into the shape of a series of living grains, which are stored away in the interior cavities. As daylight falls upon the membranes of living plants, its vibrations penetrate through the outer transparent films, until they reach the chlorophyll grains within, where all the vibrations but the green are absorbed. So chlorophyll is first organized in the outer coating of fruit, and then is changed into coloring matter by the oxidation of the green granules, which change from green to yellow, brown and red, is simultaneous with the failure of the tissues to elaborate chlorophyll where the base of vegetable color is oxidized.

While we have seen that Nature paints always with light, to make the fruits of the earth attractive, let us inquire what is there in the constitution of a fruit, and what are its uses beyond the agreeable taste its juices afford. Fruit is the ripened pistil, and such accessory organs as are attached, which pistil undergoes, in maturing, an increase in size and a change in the tissues and in the substance; as in the grape it is charged with acid, or in the persimmon with tannin, when it enlarges, and, as the fruit reaches maturity, the acidity or astringency gives place to sweetness, and usually takes on an attractive external hue. In all the wonderful varieties of color, texture and form, fruit is only a modified leaf. In the peach, the stone is the upper skin of a leaf, hardened so as to protect the seed. The pulp is the cellular tissue expanded and endowed with nutritive properties for the sustenance of the embryo plant, and the downy exterior is the lower cuticle of a leaf enveloped in a sun bloom, the hollow line on one side of the peach marking the union between the two edges of a leaf. In the apple the parchment-like core is the upper surface of a leaf, and the flesh is the cellular tissue greatly swollen. In the orange the juicy lips enclosing the seeds are the different sections of a leaf developed in an extraordinary manner; while through the transparent skin of a ripe gooseberry, we see the ramifications of the leaf veins, conclusively proving its origin. A simple fruit is only a seed vessel formed by the ripening of one pistil, although a pome fruit comes from a compound pistil, with a coherent calyx tube. With these several peculiarities of structure, we eat under the name of a fig a hollow flower stalk; in pineapples and mulberries we partake of clusters of flower leaves, as well as the stalk they cover. In quinces, pears, and apples we eat a fleshy enlarged calyx; in peaches, plums, apricots and nectarines the outer part of a seed vessel, and in cranberries, grapes, blueberries and gooseberries, the whole seed vessel grows rich and pulpy. And while we are charmed by all this diversity and beauty so wonderful and yet comprehensible, color has its uses and purposes in nature, since we see it intimately connected with the existence of the species of the vegetable world, appropriated and modified for their advantage, making variation of color a necessary concernment of modification of structure, development and growth. All of the bright colored species of fruits depend upon animals for their diffusion, and those which do not are of a dull cast, from which we infer that color cannot of itself subserve any special function except in connection with the eye of animals. Those parts of plants are almost invariably

colored with some brilliant hue distinctive from the green of ordinary vegetation when any benefit can be derived by attracting the eyes of birds and mammals. The ordinary red, orange, purple and yellow tints of ripe fruits, which attract birds to eat them, and thus distribute their seeds, is to them very marked in contrast with the green foliage. Those seeds of fruits that would be injured by the interference of birds, are protectively colored green or brown, while those which are attractively colored pink, orange, purple, yellow, red, blue, or black would be aided by their contact. These seeds in order to be moved to distant localities for the purposes of germination and growth, must be diffused; especially those mostly contained in eatable fruits which cannot be scattered by the wind. The hard seeds are dispersed undigested in a condition favorable for germination, under the influences to which they have been exposed.

Eatable fruits when mellow and juicy almost invariably acquire bright colors; but it is not so with nuts and other hard fruits of large forest trees, (though often eaten if not made attractive) since the seed is not intended to be eaten, for its destruction would be injurious to the species. These colors are protective, green, and almost invisible among the foliage, and turn brown, when they fall ripening to the ground. In the attractively colored fruits the seeds are of such a nature as not to be destroyed when the fruit is not consumed, as in the fig and strawberry the seed is very small and comparatively hard; in the grape harder, larger and less eatable; in the orange tribe very bitter, while in the plum and peach, where the seeds are softer, of more size and better to eat, they are protected by a very hard stony covering, and in the apple are enclosed in a tough horny core; from which we are to infer, that certain fruits are so constructed and adapted to attract the attention of birds and mammals, as to be dispersed by their aid. The fruits proper that we are best acquainted with apples, pears, cherries and berries, are animal dispersed, voluntarily aided, having hard and indigestible seeds, coated or surrounded by a soft, sweet, pulpy, perfumed, bright colored and nutritious covering. By these agencies, the fruit allures the birds and mammals to swallow and disperse undigested seeds, and as a reward for their services give to us, the healthful and luscious morsel to gratify the eye and taste fulfilling the ultimate object of flowering which is the production of seeds or embryo plants, destined to replace their parents and continue the life of the species to future generations. The rose family, which comprises fruits that we are most familiar with, contains the greater number of fruity seeds, but was not discovered until the Miocene period; hence there were no fruit bearers before the evolution of the fruit eaters, who called them into existence. Birds and mammals are the means of producing fruits, and fruits excite a taste for color in animals; and while these several seed coverings are succulent and nutritious, they must also be conspicuous and alluring. The sweet, pulpy substance in the fruit makes its appetizing juices, also an additional attraction for the animal senses. Let the fruit be ever so luscious, it would never entice the robin or friendly parrot, if it were hidden between a mass of green leaves, or clothed in the retiring garo of the green nut. To attract afar off the eyes of wandering birds and mammals, the fruit must be clothed in a gorgeous livery of crimson, scarlet and orange. An apple tree laden with its red cheeked burden, an orange bough weighed down with its golden spheres, have the same influences as do the orchids and rhododendrons; the first displaying their brilliant colors to the birds of the air, the latter spreading their bright petals before the sight of bees and butterflies. We notice too, that different means are selected for attracting observation, like the remarkable variations we see in the strawberry where the receptacle forms the fruit; in the apple which depends on the peduncle, and in the raspberry, where each seed vessel has its own juicy coating.

Our subject naturally leads us to inquire if there is a law of relation between the color of the flesh of fruits and the flavor. Richness and delicacy united with a degree of tenderness of flesh flesh are very desirable qualities; and if the theory advanced proves to be true, that we can modify the sharpness, bitterness and firmness of fruits by selecting the white fleshed varieties, such an aid toward the amelioration of fruits would be of great value. It is claimed that a greater degree of sweetness and delicacy is found in the light-colored than in the dark flesh of certain varieties of pears and peaches, apples and currants. A

pleasant flavor is always an important characteristic in selection, and often for their appearance, we prefer the colored pulp; but whether light or dark, we reject seedling fruits that have a harsh flavor, and retain those that are pleasant to the taste. I think we are not yet willing to establish a law upon a subject of so limited an investigation, for the evidence is not so fully extended, as to have a practical application toward an improved fruit culture. After examining a number of varieties of the peach, pear and apple, we find that a majority of the white fleshed are sweet, mild and tender, and that a greater acidity is found in those that have a darker or stained pulp, which does not necessarily make them more to be sought for; besides there is a contradiction to the theory claimed, as a larger sub-acid percentage exists in the white fleshed varieties, thus supplying an important element to a correct standard in their flavor. In many of our favorite apples, we find the yellow flesh, as in the Wagener, Swaar, Mother, Tompkins King, Garden Royal, Coggswell, Hubbardston, and Peck's Pleasant; while those of an inferior quality like the Ben Davis, Tetofsky, Hurlburt, Detroit, Saint Lawrence, and Maiden's Blush have a white fleshy pulp. In many of our best pears, we also find a tinted flesh as in the Dana's Hovey, Flemish Beauty, Passe Colmar, Souvenir d'Esperen, Louise Bonne of Jersey, Nelis and Josephine of Malines. I cannot determine, that color has so important a signification in the flesh of the apple and pear, as to conduce to their amelioration, besides these species never have a dark pulp, like the plum, grape, raspberry and blackberry, being only slightly tinged in their enlarged calyx.

The conclusions in reviewing our subject are, that change of color in the fruits is often associated with a decrease or cessation of nourishment; that generally the tints are the richest on those plants that are the most vigorous and healthy; and that the coloring matter in the fruits is almost entirely due to the phenomena of absorption, although the hues produced by the dispersion, interference and polarization of light, have a scientific interest, and aid to frame a true theory of color. The brilliant tints for the contemplation and enjoyment of man, are also set there as baits and traps to entice the birds and mammals to come to them, in order that the seeds which are eaten may be dispersed over the earth to perpetuate the life of their kind, representing a beautiful natural adaptation, and a sublime creation; and wisely is the immature fruit constructed so as to remain unnoticed clad in a coat of uniform green, undistinguished from the surrounding foliage. Physical science has not yet solved all the speculative problems, and hence as a basis in order to unravel the intricacies of truth, we are forced into the realms of philosophy, to ascertain the process by which the painting of nature with color is produced. There no doubt exists some unknown innate and internal law, which determines at the same time both coloration, and its transmission to us; and it is reasonable to suppose that whatever cause has produced the brilliant colors in either fruits or flowers, may have produced them in both.

The dull, pale tints of rocks and earth are in strong contrast with the silvery light of June's delicate tones, and the golden gloss of September's coloring; yet as we gaze on the fruits which are beautiful for our admiration, this pleasure of color raises itself above the common level of gratification and attains to the higher plane of æsthetic delight. Our first visual æsthetics were the appreciation of the bright colors in the fruits; for their brilliant hues and sweet juices formed the earliest pleasures of childhood, and linger as the main sensuous factors of our nature. As ideal stimulants of æsthetic feeling also, this orderly succesion of gently blending hues enters largely into the composition of poetry,

> "Since loaded trees confessed the fruitful mould,
> The reddening apple ripened like to gold;
> Now golden fruits on burdened branches shine
> While purple clusters swell with floods of wine."

WEDNESDAY—EVENING SESSION.

The exercise of the evening consisted of an illustrated popular lecture on

INJURIOUS FUNGI, IN THEIR RELATION TO THE DISEASES OF PLANTS.

BY

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INTRODUCTORY.

In this day when we hear and read, and talk so much about the injurious fungi, it is well that we spend some time in an inquiry as to their general nature and structure, in order that we may the more intelligently discuss proposed remedies and methods of prevention.

I am impelled to take up the subject here for the reason that I find so commonly in the general periodical literature of pomology a great misapprehension of the nature of the fungi, their modes of reproduction and the manner in which they produce disease in vegetation. Now the pomologists are not to be blamed for this. We must not charge them with culpable ignorance in this matter. The blame lies elsewhere. It lies with those whose business and duty it is to teach as to the structure of plants. The instruction in botany in this country has been for many years almost entirely confined to such study of structural details as would enable the student to find the names and classification of the flowering plants and ferns of his region. The fungi, if noticed at all, were in most cases taken up in a few lectures given as a sort of appendix to the subject. What wonder then that some men who have had a course in botany in the schools should have vague notions as to the fungi? And need we wonder that men who have been obliged to get their knowledge of the vegetable kingdom by home reading, as is the case with most of the older men, should find it difficult to master the subject. If the professional teachers of botany, and others who have been specially trained in the science, neglect this branch of the subject there is certainly great excuse for any misapprehension of it by any class of plant growers.

Before I leave this part of the subject I want to say that the condition of things I have just described is rapidly passing away. There is growing up now in this country a school of botanical teachers and writers whose numbers regard all vegetation as legitimate objects of study, and who do not confine their instruction to preparation for the analysis and classification of flowering plants alone. In this new school of botanists, moreover, the economic aspects of botany stand out prominently. The physiology and pathology of vegetation include nearly every economic phase of the science. In this new school the habits and the modes of reproduction of the lower plants are regarded of equal importance with those of the higher forms of vegetation. A fungus is as interesting as an oak, and the life-history of the former receives at the hands of the botanist of to-day as much attention as the latter. From such botany, and such botanists, pomology and all branches of horticulture and agriculture may confidently hope to derive great benefits.

GENERAL NATURE OF A FUNGUS.

With this much by way of introduction permit me to proceed to the first topic of my address, viz: the general nature of the fungi. At the outset I must call your attention to the fact that the plants included under the general name of the fungi are exceedingly numerous, and that they present greater differences in structure, reproduction, nutrition and habits of life, than are to be found in all the plants that the farmer, or the gardener, or the pomologist has brought under cultivation. Nay, more, if we compare the greatest sequoia or eucalyptus with the tiniest moss which grows upon its bark, the difference in size alone is far less than between the largest and smallest of the fungi, while in modes of nutrition and reproduction the differences are still greater. In fact, the fungi do

not constitute a single group of plants with similar structural and other characters. They are, on the contrary, many groups of plants, with varying degrees of difference and resemblance.

With these facts before us we are prepared to understand that it is manifestly impossible for us to treat all fungi alike. Of half a dozen fungi growing upon the trunk of an apple tree, it may happen that no two of them bear any resemblance to each other in structure, habits or their relation to the life of their host.* It is thus manifestly of little value for us to say that this or that trouble with our trees is due to fungi. The greatness of the group, and the diversities of its members are so excessive that the idea properly to be associated with the word fungus is too general and vague to be of much practical value. Let us but remember that the name fungus is applied to the minute Micrococcus and to the puff-ball whose body is more than two hundred quadrillion times as large and we may to a small degree appreciate their diversity as to size at least.

We are thus obliged to make some sort of classification of this great group for convenience, if for no other reason. One of the most convenient of the physiological classifications (and perhaps one of the most profitable too) is that which sets them off into two or three groups, viz: the (1) saprophytes, (2) the parasites and (3) the parasite-saprophytes.

THE SAPROPHYTIC FUNGI.

By the saprophytes we understand all those fungi which live upon dead or decaying matter. Such are many of the moulds familiarly represented by the pastry-mould (Penicillium) which so often occurs upon pies, bread, etc. The toadstools which spring up from the heap of rotting vegetable matter in the barn-yard are saprophytes of a high order; and so too, are the great puff-balls so common in meadows and woodlands. Saprophytes abound in and upon all decaying timber. Every log in the woods furnishes in its decaying substance the food upon which many species are nourished. In every case the saprophyte obtains its food from dead matter, and not from that which is living, consequently the grower of trees need have no fears of injury from fungi of this kind.

* The host in the plant or animal fed upon by a parasite.

THE PARASITIC FUNGI.

Those fungi which obtain their food from the living tissues of plants or animals are termed parasites. They penetrate the bodies of their hosts and absorb the nutritious matter of the cells for their own use. In some cases the result is simply a lowering of the vitality of the part infected, while in others the injury is so great that the cells die and the tissues fall into decay. The particular difference, then, between a saprophyte and a parasite is that while the former attacks and feeds upon dead animal or vegetable matter, the latter confines itself to living tissues. The parasite dies if its host dies. It must have living tissues for its nourishment; but the saprophyte feeds only upon the dead tissues, not being able to attack living cells. The domain of the parasite ceases where that of the saprophyte begins, hence it often happens that the latter completes the work of destruction begun by the former.

THE PARASITIC—SAPROPHYTIC FUNGI.

Lying between the classes of fungi just described is another vaguely defined class connecting the other two. These are the parasite-saprophytes, that is, the fungi which, while essentially saprophytic in habit, are given to more or less of parasitism also. They attack languishing tissues, and hastening their death, then feed upon the decaying mass, and in many cases they even begin their work upon apparently healthy cells. There are all gradations in the fungi of this intermediate class connecting the genuine parasites with the purely saprophytic species, and, as has lately been pointed out* these are the fungi which are probably the most to be dreaded. A true parasite requiring living tissues for its support must necessarily work slowly enough so that the leaf, stem or fruit affected, shall continue to have living cells throughout the period required for the full maturity of the fungus. There is, thus, a natural check placed upon the parasites, which prevents their becoming as destructive as those which, while parasitic are at the same time saprophytic.

Now, it must be borne in mind that the three classes of the fungi mentioned, are established upon their habits alone. This is not a scientific classification, but a convenient physiological one,

* J. C. Arthur in Rept. N. Y. Agrl. Experiment Station for 1884.

which enables us to group together those having similar habits without regard to their structural characters. In the further discussion the terms saprophyte, parasite, and parasite-saprophyte will be used descriptively with the limitations and definitions given above.

THE PRINCIPAL FAMILIES OF THE HARMFUL FUNGI.

I come now to the second part of this paper, and ask you to follow me with some care while I pass in rapid review before you the principal families of the injurious fungi. I here propose to direct your attention to those general features of the groups of harmful fungi, which will enable you to see why some are so much more injurious than others; how they are reproduced, and the manner of their development.

It should be said at the outset that these groups are made by considering structure alone; in other words, all modern classification is based upon the structure of the plant body and the different organs of which it is composed. The practical value of this principle of classification is readily seen when we realize that by it we bring together all those plants whose modes of reproduction are smilar. A skillful botanist is thus enabled to predict with much certainty the life-history of a fungus from an examination of but one of its stages. Nay, more, from a single spore it is often possible, not only to make out the family to which a plant belongs, but also to indicate with reasonable certainty the general structure, and habits, as well as the general methods of reproduction. One is thus often enabled by a mere glance at a fungus to determine its harmlessness, instead of being obliged to enter into a long and tedious investigation.

1. The Bacteria.—This is the lowest family of the fungi with which we have anything to do in this paper. There are other families whose members have a still simpler structure, as for example the Slime-Moulds (*Myxomycetes*), but they need not concern us at the present, although it appears that some of them are harmful.

The Bacteria have been described as the smallest of living things, many of them being no more than a 20,000th of an inch in diameter; others are still smaller, running down to a 40,000th to a 50,000th of an inch. Such minuteness is absolutely beyond our conception. If we were to magnify one of the smallest of these so as to make it appear as large as a moderate-sized apple, an apple equally magnified would be over two and one-third miles in diameter. Or allow me to bring before you another illustration. If the body of an average man were cut up into bits the size of the smaller bacteria, and then these laid out in a single line touching one another, the line would be long enough to stretch almost double the distance from the earth to the sun. It would be long enough to completely encircle the earth at the equator more than six and a half thousand times.

Now these minute organisms are single-celled plants, or little chains of cells. They obtain their food by simple absorption from the medium surrounding them. Thus if they grow in the blood of an animal they absorb the plasma of the blood, or possibly portions only of it, and in this way are enabled to increase in size and substance. By changing the proportions of the constituents of the blood, or of a plant cell they produce a fermentation which completes the work of destruction.

The most common method of reproduction in bacteria is by the simple division of one cell into two. Imagine an orange gradually constricting itself in the middle while the two halves keep swelling. This would represent the fission of a bacterium. Thus every cell may become two cells, and so on the reproduction goes, each step being a multiplication by two. You all know that the earlier steps of a geometrical progression are short and slow, but after a time the stride is by millions and billions. So it is with the development of bacteria. When an inoculation takes place, as in the experiments on apple and pear trees first performed by Prof. Burrill, and afterwards by Mr. Arthur, there is always a period of incubation, during which the bacteria are multiplying. The beginning of this period is one of apparently perfect health, but it finally merges with increasing rapidity into the state of active disease. We can now understand what the period of incubation is. It is the time required by the bacteria to carry their geometrical progression far enough to bring about much disturbance in the infected tissues.

There are other methods of reproduction, as by the production of still more minute spores, but we may for the present pass these by. I must not omit calling attention to the manner

of distribution of the bacteria. When the juice of an infected apple tree exudes upon the side of a twig, the rains may wash out the gummy matter leaving the bacteria exposed to the dry winds. By these they may be picked up and carried half way round the world. That bacteria are carried in the air may be demonstrated by the simplest experiment, as follows: Put a little boiling soup into a cup which has been just taken from boiling water and expose it to the air. If the temperature is high enough (20° to 25° cent., or about 70° to 80° Fahr.) in a few hours bacteria can be detected, and in a couple of days the preparation will be swarming with them. Lyndall, however, found that while the lower strata of the air are laden with bacteria, the air of the upper regions, say at an altitude of several thousand feet, is free from them.

It is pretty likely that many bacteria are incapable of withstanding the prolonged drying of the air of the desert-like regions of the earth. It is well known that in some parts of the west where the air is very dry the exposed beef and venison remains perfectly sweet for days, and even weeks. This would be impossible in an air swarming with bacteria.

The study of the bacteria has acquired a new interest to the pomologist within the past five years. The brilliant discovery of the agency of bacteria in the production of blight in apple and pear trees, made by Professor Burrill in 1880, * and since then fully confirmed by Mr. Arthur in an extensive series of experiments and observations at the New York Agricultural Experiment Station has entirely changed the whole aspect of the long continued discussion regarding the disease. A blighting tree is suffering from a disease analogous to the small-pox of the human subject of the anthrax of our domestic animals.

II. The Mildews.—(*Peronosporeæ*). I pass over a number of families of the fungi in order to take up the extreme parasitic plants which sometimes are called the mildews. They are all plants of much higher organization than those we have been discussing; in fact the distance from the bacteria to the mildews is vastly greater than from the lowest flowering plant to the highest.

The plant-body of a mildew consists of long slender, tubular, branching threads which penetrate the tissues of the host, and ramifying there in every direction, gather food from the living cells. If we take a plant which is affected by one of the mildews we find its tissues penetrated by slender branching threads. Many of the threads send out here and there short root-like branches which enter into the interior of the cells and act as suckers for drawing out the nutritious matter they contain. This, of course, is quickly followed by the death of the cells so affected.

These threads in the interior of the host keep on growing until they have gained sufficient strength to begin the process of reproduction. This takes place as follows: The parasitic threads begin growing out towards the breathing pores of the epidermis, and pushing through these emerge into the air. Here they branch repeatedly (in most cases), and finally the ends of the ultimate branches swell up and then become pinched off, as roundish spores. In this way myriads of spores are produced, and as they are very small, and very easily dislodged, they are picked up by the lighest breeze and carried to greater or less distances. Every spore which falls upon "good ground" so to speak, springs up and brings forth as did the seed in the scriptural parable, "some thirty, some sixty, and some an hundred fold."

Every such spore requires a certain amount of moisture to enable it to germinate, so that should it fall upon a leaf which is not moist enough it will not germinate. Moreover, should it germinate upon a leaf of a species unsuited to it, the growth will soon cease. Still more, if favorable conditions are not obtained soon, the spore dies, and germination is impossible.

The method of germination varies somewhat with the different species. In some cases the spore bursts and sets free its protoplasm which has broken up into little swimming bodies—zoospores. After a time these turn into minute spores, and they then germinate by forming a tubular prolongation. The latter soon bore through the epidermis into the tissues of their host. In other cases the spore in germination produces a tubular prolongation at once, not breaking up into zoospores, and this tube bores into the host directly. In either case the spores so produced are for the quick reproduction of the fungus. And notice right here that this

* See Proceedings of the American Association for the Advancement of Science, Vol. XXIX, 1880.

because of certain general resemblances, but it must be borne in mind that until we know their whole life-history we cannot be positive as to their position here.

In general, we may say that the black-fungi are parasitic or saprophytic plants, with usually somewhat hardened tissues. In their earlier stages their thread-like growths extend themselves through the tissues of their hosts, and feed actively upon them. They soon produce upon the surface of their host myriads of minute spores, which are non-sexual in character, and which are evidently designed to quickly produce more black-fungi. The disease for such it may truly be called, is extremely infectious at this stage. The minute spores may be blown from plant to plant, or carried by birds or insects, or even rubbed off upon unaffected parts. They germinate freely, and soon produce more of the fungus, if the conditions are favorable.

Later in their history these fungi produce the hardened, blackish or dark growths, which give name to the group. In these hardened growths there are developed spores similar to the later spores of the blights. In both groups the spores are in sacs; hence in blights and the black-fungi, together with a number of other families are gathered into the great class of the sac-fungi (*Ascomycetes*).

The black knot of the plum and cherry (*Plowrightia morbosa*) is a good illustration (though a somewhat complex species) of the black-fungi, and its reproduction may be taken to represent that of the whole group.

In the spring of the year the parasitic threads of the black knot multiply in the young bark and wood, forming the well-known knot-like mass. It is composed of threads of fungus intermingled with an abnormal development of the tissues of the host plant. The knot at this time is dark-colored and has a velvety appearance due to the fact that its surface is made up of myriads of short fungus threads which stand vertically. Each of the latter bear one or more minute spores, which are very easily detected. These are the non-sexual spores, spoken of above as the contagious elements of the fungus.

During the latter part of summer there are formed spore-sacs for a reproduction of another kind, and which is probably sexual in its nature. The knot begins to harden externally and internally, and to form minute wart-like excrescences. In the latter are the spore-sacs, which in the winter perfect their spores. If a knot of this fungus be taken in midwinter and careful sections made of it, the small sacs and their contained white spores may be readily seen under a moderate power of a microscope. During the latter part of winter these spores drop out and are doubtless blown away by the winds. They germinate by protruding a tubular thread, which eventually finds its way into the tissues of its host.

Now, there are many fungi which pretty certainly belong to the Black-fungi, of which we only know the first mode of spore formation. That is, we have been able to trace their life-history only as far as to the development of their non-sexual spores. In this list we must place the fungus which causes "Strawberry rust" (*Ramularia tulasnei*), that which produces the spotting of Horseradish leaves (*Ramularia armoraciæ*), the Parsnip fungus (*Cercospora apii*, var. *pastinacæ*), the "Beet rust" (*Cercospora betæcola*), the "leaf-blight" of the apple(*Fusicladium dendriticum*), which has lately been shown to be identical with the "apple scab" by Prof Trelease, the bean-fungus (*Glœosporium lindemuthianum*) which causes the destructive spotting of beans; the dry-rot fungus of the grape (*Phoma uvicola*), etc., etc.

Here is indeed a rich field for research for the economic fungologist.

The Rusts (*Uredineæ*).—The last family which I will take the time to notice in this rapid review is that of the rusts, as they are popularly and very appropriately called. They present a good deal of variation as to the complexity of their life-cycles, but agree sufficiently so that all can now be readily compared with one another.

In the most complete species there are no less than five distinct kinds of reproductive bodies produced. There is first the cluster cup stage of the fungus, consisting of little cup-shaped structures filled with orange spores. With these structures there are usually others of a flask-shape (spermagones) producing minute colorless spores (spermatia), whose function is entirely unknown. The orange colored spores known as æcidiospores, germinate readily and the filaments developing from the bore into the new hosts; from this new growth there are produced a little

later many groups of stalked spores, each spore being rounded and supplied with a stalk double or treble its length. These burst through the epidermis of the host, and as they form reddish patches this is known as the red-rust stage, and the spores are red-rust spores (uredospores). These are here the particular elements of contagion, they are blown freely from plant to plant, and in warm, damp weather germination takes place at once, resulting in the rapid spread of the disease. This production of red-rust spores goes on as long as the tissues of the host, and the other controlling conditions are favorable, and then another kind of spore is developed. This fourth spore is thick-walled, and often dark-colored. It is frequently two or more celled, and is always provided with a little stalk. The dark color of the spores gives the spore clusters a black appearance; hence this stage is known as the black-rust stage, and the spores are called black-rust spores (teleutospores). These thick-walled spores are admirably adapted for resting spores, and we find that in fact they are such. In the common rust of wheat the black spores remain quiescent upon the rotting straw until the advent of the warm, wet weather of spring when they begin to germinate. In germination they send out a slender thread which soon produces a few excessively minute spores (sporids). The latter (the fifth of the series of spores) on account of their minuteness are readily carried by winds, and are thus disseminated. When the sporids alight upon a moist surface they germinate, and if the surface is a leaf of the right species, the young parasite enters and begins anew the round of life.

Many species of rusts abridge somewhat the round of life given above, and indeed it appears from the observations of Mr. Charles Plowright in England a couple of years ago, that the same species may abridge or not abridge its life history according to circumstances. He found that whereas the common wheat rust (*Puccinia graminis*) normally has all the stages first described; under certain circumstances the cluster-cup stage is omitted. When the black-rust spores germinate in the presence of very young seedling wheat plants, the sporids of the parasite have sufficient strength to penetrate the tender epidermis of the young wheat leaves. When the wheat seedlings are older the epidermis becomes too tough and hard for the delicate fungus thread to penetrate. It can, however, gain access to the tissues of the young barberry leaves, and here it grows and gains strength to produce the cluster-cup spores mentioned above.

Now, if we look over the several stages of rust we observe that, as in previous fungi, there is a non-sexual production of spores which marks the contagious period of the parasite. This is the so called red-rust stage, and here the rapid spread of the rust takes place. A single affected plant in a wheat-field may under favorable conditions thus become a center from which the parasite may spread to all parts of the field, just as a single small-pox patient may become a center of contagion in a neighborhood.

Notice again that the black-rust stage is that in which provision is made for a period of resting in the cycle of the parasite. This is the quiescent stage as contrasted with the active stage of the red rust period. There is here no contagion, and so in one sense this stage is much less harmful than the preceding one. When, however, we remember that these black-rust spores are the means of carrying the parasite from year to year, and from crop to crop, and realize that they are in this way the cause of the rust each season, we are ready to say that they are even more dangerous than the red-rust spores.

REMARKS UPON REMEDIES AND PREVENTIVES.

In a general paper like this it is manifestly impracticable to take up specific remedies; in fact, it would be impossible to intelligently discuss particular remedies without a previous discusion of particular fungi. My purpose has been mainly to direct your attenion to the great families of harmful fungi, and to the fact that they produce disorders of various kinds in the higher plants. It now remains for me to discuss in the same general way the remedies and preventives.

Let me insist, now, upon the need of keeping clearly before you the fact that there are two things which we must consider in all this discussion, namely, (1) the fungus, and (2) the disease which it produces in the plant. The fungus is a plant, and as such is subject to the varying conditions with which it is surrounded. It grows best under certain conditions. It languishes under others. It may be killed by certain

poisons, or on the other hand, it may be stimulated to greater activity by other means. Let us not forget then that the fungus involved is a real plant, which is at all times as subject to its environment, as are the larger plants with which we are much more familiar.

The disease, on the other hand, is the pathological condition of the tree, shrub or herb affected by the fungus. The fungus is not the disease, but the agent which brings about the condition of the disease. In some cases a removal of the agent will result in a restoration of a normal healthy condition again, but in others, and these are the great majority of cases, the diseased condition once established, the removal of the fungus cannot restore health again. In fact there is so little of restoration of health to diseased tissues in plants, that I am warranted in saying that remedies for the diseases caused by the fungi are almost impossible of attainment. I say that remedies, in the sense in which we use the word in speaking of the diseases of the human body are almost impossible to attain in the vegetable kingdom, where the disease is due to fungi. Your body may be filled to-day with the bacteria which produce small-pox, but by proper treatment every part of your body excepting certain surface tissues may be soon restored to a condition of health again.

Not so with the plant, when fungi invade its tissues, they are almost invariably fatally injured, and the recovery of the plant is generally rather the escape of its unaffected parts. Thus when a plum tree is attacked by the black knot you cannot possibly restore the affected branches to health. You can only cut them off, and if by so doing you remove all traces of the fungus, the remainder of your tree may be healthy. Fungous diseases call for the surgeon who amputates the injured tissues, and not for the practitioner who with pills and potions and poultices seeks to restore the tissue to its healthy state.

THE KNIFE THE ONLY REMEDY.

I have said enough to warrant me in laying down the general rule that in dealing with fungous diseases of plants the knife is the only remedy. The diseased leaf must be cut off, the diseased fruit must be cut off, the diseased twig must be cut off, the diseased branch must be cut off, the diseased root must be cut off, and in the orchard it may be that the whole tree, or even the whole orchard must be cut down, dug out and burned up.

PREVENTIVE MEASURES.

In the consideration of preventive measures it is of prime importance that the round of life of the fungus should be understood. In every parasitic fungus there is a period during which it produces great numbers of spores; this is the period of contagion, and if the fungus be permitted to reach this stage in its development, it is well nigh impossible to prevent its spreading to other tissues, and to other plants. Removal of the growing fungus before this period is that amount to a removal of the contagion. Before it the fungus is not contagious and is harmful only to the particular tissue affected, but when once the contagious period is reached every susceptible tissue in the neighborhood is in danger.

The rule, then, to be laid down is that in so far as possible every parasitic fungus must be removed before it reaches its contagious period; that is, the period of its production of non-sexual spores (or conidia).

Again, you remember that nearly every fungus produces resting spores of some sort. These appear when the fungus itself dies. Now here we have again the opportunity of destroying the parasite. Take the case of the rust of the wheat, where the resting state is the black rust on the straw and stubble; if we destroy these black spores, we prevent the formation of the sporids which otherwise would germinate from them.

Now, as I said before, nearly every fungus has its resting state, and if we are wise we will attack it here and destroy it. The dead leaves and twigs killed by the fungi of the preceding summer should be burned during the fall and winter, lest they afford shelter to the resting spores which will spring into activity upon the return of favorable weather.

I come now to the use of poisons or fungicides and will detain you but a short time upon this topic.

There are many substances which are poisonous to the spores or other parts of the fungi, and any of these may be used in their destruction. I may mention sulphur, and the many sulphur compounds; iodine, salycilic acid, borax and its compounds, as among the most prominent of these. They may be applied in destroying the

spores, as when the farmer washes his wheat in a solution of copper sulphate (blue-stone) in order to destroy the spores of smut, or they may be applied upon the growing fungus, in order to kill it, as in the application of sulphur to kill the mildew (*erysiphe*) upon rose leaves in the conservatory.

Now, in the use of such applications it must be borne in mind that these fungicides are of value only when they come in direct contact with the fungus. Sulphur for example is of use only in the case of those fungi which are upon the surfaces of plants, while it is utterly useless in case of internal parasites.

I have attempted to lay before you the general facts as to the structure and habits of the harmful fungi, and to make some general observations upon remedies and preventive measures in the belief that such information and suggestions laid before you may be as seed sown upon good ground. May I venture to hope that what has been said may prove of use and value to you, and that it may contribute somewhat to an increased study of the parasitic fungi, and the diseases of plants which they produce.

APPENDIX.

For convenience of reference I append the following list of some of the principal injurious fungi, in so far as they are of interest to the pomologist:

ORDER BACTERIACEÆ—THE BACTERIA.

Micrococcus amylovorus—Burrill. This species produces the "Pear-blight," and the "Twig-blight" of apple trees.

ORDER PERONOSPOREÆ—THE MILDEWS.

Peronospora viticola—D. By. The American Grape Mildew.

Peronospora infestans—D. By. The Potato-rot Fungus.

ORDER PERISPORIACEÆ—THE BLIGHTS.

Podosphæra tridactyla—D. By. This species often covers the leaves of young apple and cherry trees with a white mildew-like growth, doing much harm.

Sphærotheca pannosa—Lev. Gooseberry-blight.

Phyllactinia suffulta. Sacc. On the leaves of many forest trees.

Uncinula adunca—Lev. Willow-blight.

Uncinula ampelopsidis—Peck. On the leaves of the Virginia creeper (Ampelopsis).

Uncinula americana—Howe. On grape leaves, and pedicels of the fruit. This is probably the same as the so-called *Oidium tuckeri* of European vineyards.

Uncinula circinata—C. & P. On Maple leaves.

Microsphæra extensa—C. & P. On Red-oak leaves.

Microsphæra friesii—Lev. The common and well-known Lilac-blight, which whitens the leaves during summer and autumn.

Erysiphe tortilis—Fr. On the leaves and stems of Clematis, greatly injuring the plant, and destroying its beauty of foliage.

ORDER HELVELLACEÆ—THE CUP-FUNGI.

Exoascus deformans—Berk. The Peach-curl.

Exoascus pruni—Fckl. The Plum-curl.

Rhytisma acerinum—Fr. Forming shining black patches from $\frac{1}{3}$ to $\frac{1}{2}$ an inch in diameter on the leaves of the Silver Maple.

ORDER PYRENOMYCETES—THE BLACK FUNGI.

Plowrightia morbosa—Sacc. The Black-knot of the Plum and Cherry.

Gnomoniella coryli. On leaves of Hazel.

Gnomoniella fimbriata. On leaves of Carpinus.

Phyllachora ulmi. On leaves of White Elm.

Nectria cinnabarina—Fr. On twigs of various forest trees.

Microstroma leucosporum—Mont. On leaves of Butternut.

Ramularia celastri—E. & M. On leaves of Bitter-Sweet (Celastrus).

Ramularia tulasnei—Sacc. The so-called Strawberry-rust.

Ramularia armoraciæ—Fckl. Common on the leaves of Horseradish forming white dead spots.

Fusicladium dendriticum. This is the so-called "leaf-blight" of the apple.

Phoma uvicola—B. & C. The "dry-rot" of the grape.

Phyllosticta. Many species are destructive to the leaf tissue of various kinds of trees.

Ascochyta. Species of this genus are also destroyers of leaf-tissues.

Septoria. This is another genus of leaf destroyers, and is represented by many species.

ORDER UREDINEÆ—THE RUSTS.

Puccinia amorphæ—Curt. The rust of the leaves of Amorpha.

Puccinia graminis—Pers. Grain-rust. The first stage is the so-called Barberry-rust which appears on the leaves of Barberries in the spring.

Puccinia prunorum—Lk. The rust of the leaves of young trees of Wild Cherry.

Phragmidium speciosum—Fr. On Wild Rose.

Phragmidium subcorticium—Wint. On Wild Rose.

Gymnosporangium macropus—Lk. The "Cedar Apple" of Red Cedar trees.

Melampsora populina—Wint. The rust of Cottonwood leaves.

Melampsora salicina—Lev. The rust of Willow leaves.

Uromyces luminatum—Schw. Raspberry-rust.

Æcidium fraxini—Schw. The rust of the Ash tree.

Æcidium grossulariæ—D. C. The rust of Gooseberries.

Æcidium sambuci—Schw. The rust of the Elder.

Rastelia lacerata—Fr. The rust of Hawthorn leaves.

Rastelia penicillata—Fr. The rust of Wild Crab Apples, and Service berries.

TUESDAY-MORNING SESSION.

The meeting was called to order at 9 o'clock, P. Barry in the chair.

The following telegram was read from W. C. Barry, of Rochester, New York:

SARANAC, LAKE HOUSE, N. Y., September 10, 1885

PROF. W. J. BEAL,

Secretary American Pomological Society.

I regret exceedingly that it is impossible for me to be present at the session. I hope the meeting will be a great success.

WM. C. BARRY.

The first subject of the programme was a continuation of the topic "Injurious Fungi." A conversational address, of which the following report gives the main points, was given on some recent experiments which had been made at the New York Experiment Station on

PEAR BLIGHT

By Prof. J. C. Arthur.

PROF. ARTHUR said: There are undoubtedly a number of things confounded with Pear-blight. I shall speak of only one disease. This shows itself by the limbs turning brown and dying in a few days. The dying limbs give out a peculiar odor. The appearance of a blighted branch does not differ in any respect from that of a branch dying from any other cause. In the pear the leaves turn black and its disease is readily noticed, but in some other plants they only turn brown so that the disease is not so readily seen.

The first scientific work done on the pear-blight, to investigate the nature of the disease was by Prof. Burrill, six years ago, and announced in 1880 at the meeting of this society in Boston, when he said that the disease was due to germs which he found in great quantity in the diseased limbs. He had found that the disease would follow innoculation. This could be done by inserting a little of the juice of a diseased limb into a healthy limb. This was practically the extent of Prof. Burrill's work. It, however, was a very important beginning.

The first work that I did on this was a year ago this season, early in the spring. It consisted at first in going over the ground gone over by Prof. Burrill. Most of us have probably observed that a diseased limb exudes a gummy substance. If a little of this matter be transferred to a healthy limb, it will produce the disease. My first experiment was to transfer a minute quantity of this gummy substance, and by means of a pin, prick it into the tip of a growing pear limb. In these cases the disease invariably followed, generally in about two weeks. If the germs were inserted in an older limb it sometimes failed. More than 120 of these experiments were recorded with all the dates in the books of the Experiment Station. I found, however, that I could transfer the disease more certainly by cutting up a little of a diseased limb in a small amount of water. The water would become slightly milky with the liberated germs, and to innoculate a limb I used a small drop of this milky water.

It may be objected that disease would follow the pricking of a limb anyway. To determine this I made some wounds in limbs in which I inserted none of the germs, and in no instance was there any disease in these cases. There were no cases of pear-blight within a mile and a half, and had not been that season, so there was no danger from contamination from such a source.

I found that the progress of the disese was most rapid in warm weather, especially in July. None of the experiments succeeded after the 2d of August; that was because I could not find any tissues sufficiently tender. My best results were obtained by innoculating into the young fruit. Since then I have made all my experiments on young fruits, and in these cases my results have been perfectly uniform. The disease does not show itself rapidly; it takes a good while for it to grow enough to kill that part of the tree—generally seven to eight days before the disease showed itself externally. The disease spread as a brownish discoloration up the limb a

little faster than down it. If I split a limb lengthwise I generally found that the injury extended farther on the inside than on the outside. It would extend along the branch for a foot before showing in the leaves, the leaves not showing the disease for a week or more after the limb was dead. Then the leaves turned brown suddenly, generally in a spell of hot weather. In such cases, it is generally supposed that the disease has struck the tree at that time, whereas it has probably been in the tree for more than a month.

In my early experiments, I innoculated into the leaves and always failed, except when I used very young leaves. The disease will live in the branches through the winter. In my experiments I always cut off the limb as soon as the disease had progressed far enough so that I was certain that I had got results. This I did, so as to control my experiments and have no contamination. Two limbs I left through the winter, and during the winter the disease in one of them extended a foot, in the other a foot and a half; one was a Bartlett, the other Flemish Beauty, but I do not think the difference was due to variety. In the spring these limbs that had the bark and young wood perfectly dead, leaved out, and on one, the leaves remained a month, and on the other longer, before they turned black. The explanation is, that the disease does not work much in the leaves, and also, that although the living tissues are dead, water passes up through the heart wood and supplies the buds and leaves with moisture for a long time. The heart-wood in these cases is not dead and brown like the new outer wood.

My next enquiry naturally was to learn how the disease was propagated from tree to tree. Prof. Burrill tried to determine this. He tried diseased limbs among healthy ones, and in no case did he succeed in conveying the disease to a healthy limb. This was done in July when the blight was spread most rapidly. I tried another experiment. I placed a young potted pear tree in a bell jar, air-tight, and within a few inches of some diseased twigs covered with the gummy exudation, and then I pumped air through the bell-jar in such a manner that it must pass from the diseased limb over the healthy tree. This was kept up for several hours, but in no case did I succeed in communicating the disease. Then I thought that the disease might enter through the root. I took, therefore, a young healthy potted pear tree, and for a month watered it with water made milky by the germs of the pear disease. The plant still remains healthy, though that was done over a year ago, and I still have the plant in the pot. Hence the disease does not enter by the root. I next thought that possibly disease might enter during a rain-storm. I therefore took young shoots and arranged them so that a drop of water would strike on the twigs about four times a minute. In these cases I found that by performing my experiment carefully I could communicate the disease. This, however, did not explain very much.

This spring, in June, I observed a Hawthorn which was half blighted. I found that the flower clusters at the ends of the dead sprouts were exactly in the same condition that they were when opened. All the flower clusters which had not blighted had fruit two-thirds grown—this was the 20th of June, and they blossomed about the 20th of May. It was then thought that the blight had entered the plant through the flowers, probably where the nectar was secreted. I found, however, that there were many limbs blighted on which there were no flowers. In all these cases, they were vigorous shoots, and the blight had begun at the tip of the shoots, so that only the youngest leaves were dying. These facts indicated that the blight entered the tree through the flowers and youngest parts, and not later than the 20th of May, though it took a month before it showed enough to attract attention. This season in observing the pear trees, I found that in many cases the blight entered by the flowers, for some were found no farther advanced than when they opened, when elsewhere the fruit was half grown. The pear does not ripen its wood so fast as the Hawthorn, and therefore the blight usually has a better opportunity to enter through the growing shoots. The Mountain Ash like the Hawthorn, ripens its wood early in the season, and hence, like it, is not very liable to blight. I performed my innoculations not only on the pear but also on the apple, hawthorn, service berry, quince and other trees. In all cases the same disease was produced whether the germs were from the pear or from any of the others. The disease varies only on account of the differences in the tissues, *i. e.*, in the apple,

which has more solid wood than the pear, the disease does not progress so rapidly and does less injury, generally stopping after going six inches or a foot, and seldom killing the tree. But there was still much to explain about the disease. If it did not enter through the branches how was it propagated from tree to tree? I took up in the early part of this season the experiment of growing germs in artificial media. I first made an infusion of corn meal by boiling a little of the meal in water, and filtering it until I obtained a clear liquid. Into this I introduced a small bit of a diseased pear branch. The experiment was at about the temperature of 70° Fahr., that of a warm room. I found within two days that my colorless solution became milky with the germs of the disease. I placed a drop of this on another portion of the clear infusion, and in two days more that was also filled with the germs. This proved that the germs would also grow in perfectly dead matter. I tried hay tea, and found that it worked in the same way, but not so vigorously. I found also that the disease would grow in almost any substance, that contained starch or some analogous substance. It would even grow in barn-yard manure, but not very vigorously, and in almost any decaying substance.

Now the trees are diseased in the spring, the disease showing itself most in July. As the the disease progresses, the germs exude on the surface and the gummy substance is washed off, the germ is dissolved and the germs set free and washed into the ground. The germs multiply then in rich mold and grow all winter, or year after year. In a dry time the wind takes up the germs into the air, or they may also be taken up by simple evaporation. Now when the surface of the tissues is tender and moist as in the spring, the air laden with these germs playing over the trees brings the germs in contact with the delicate tissues; the germs are held there by the moisture and enabled to grow—the disease gets a foothold, and in the course of a month or two, it shows itself by the sudden blackening of the leaves.

It was assumed by Prof. Burrill, that, because these germs were invariably present and the disease could be communicated, that the germs were the cause of the disease. This season I undertook a rigid prof to determine whether the germs were the true cause. In March I began by sowing a small particle of a diseased pear limb that had had the disease all winter, in one of my corn meal cultures. From this I took a small drop into a fresh culture, a test-tube full, and from this after a time a drop to another culture, and so on. I ran two series of cultures, six in each series. From the last of the cultures I introduced a drop into a pear. It was thought that the germs of the accompanying disease produced the disease. This experiment was to determine whether such was the case. The germs had multiplied in the cultures, the accompanying juice being dead, simply diffused itself, hence by going through the six cultures I had diluted the juice in the original drop to practically nothing, and had my germs free from the original juice of the diseased limb.

Now these germs free from the original juice invariably produced the disease. This proved absolutely that the germs were the cause of the disease. To make the matter doubly sure, however, I tried another experiment to determine that the juice would not produce the disease. I filtered from a solution containing an enormous quantity of the germs, all of the germs leaving nothing but the juice. These germs will pass through any number of filter papers, so I used an unglazed porcelain battery jar, of very fine porcelain The solution was made by slicing up diseased pears in water. The solution, which came through readily in two hours, was translucent and contained no germs. I inoculated healthy tissues with this juice, and at the same time with some of the juice which had been filtered. In no case did I get the disease from the material which had been filtered, and always in the other case; hence the germs, and they only, produced the disease.

I also wanted to show that the germs were specific. Not all the bacteria will produce pear blight. I wanted to show that while the germs of the pear-blight produced the disease, it was only one particular kind that produced it. I took various germs from rotting substances and inoculated trees with them. I first tried the material which produces the rot in green tomatoes, but in no case did I get any effect. I also used bacteria from various other sources; I am carrying on with my experiments on pear-blight, cultures of bacteria of various kinds, and I inoculated pear limbs with all the various sorts, and with none of them did I get the blight. The

germ producing the blight is *Micrococcus amylovorus*.

These experiments carried on for two seasons show that the disease is due to germs communicated through the young growing branches, or through the flowers; that they multiply in decaying matter; that it is only the germs, and only one specific kind of germs, which produce it.

At the close of the lecture the following telegram was received and read from President Wilder:

To the American Pomological Society in session at Grand Rapids, Michigan:

Many thanks for the telegram of greeting and congratulation. I accept the trust you have again put in my hands. Go ahead, and may God bless the grand old pomological society.

MARSHALL P. WILDER.

DORCHESTER, MASS., Sept. 10, 1885.

The following discussion then occurred on the subject of Pear-blight.

JOSEPH LANNIN, South Haven, Michigan: Would the simple inoculation of one twig disease the whole tree?

J. C. ARTHUR: Possibly. It would depend on the tree, on the weather and various other things. In young pear trees it seldom does, and in the apple it is doubtful if it ever does. In the apple and quince it usually progresses only down to the first limb, and is therefore called twig-blight. In the pear it may stop at any point, or it may progress till the whole limb is killed. You have probably observed that the blight sometimes appears on the body, seeming to have entered through the bark. I think you will always find in such cases that there was a little shoot at that point which was first killed, and through which it entered. If this spot appears below the lowest branch the tree is doomed.

It has been asked whether there is any danger of communicating the disease with the pruning knife. I performed some experiments to determine this. In the first place it seemed that there would be no need of it from my not getting good results except on young tissues; but to be perfectly certain I tried a number of experiments. I took the knife and drew it through diseased branches, then cut off limbs with it of different sizes, keeping a record of them. In no case did I communicate any disease except when I cut off a very tender twig. I also took diseased pears and drew my knife through those and then cut off limbs with the same results. In no case did I communicate any disease to large limbs. Hence there is no necessity for being careful to disinfect your knife. In any case it would be easier to cut off the limb a second time rather than go to that trouble. In cutting, the limb should be taken off a foot below the lowest point where the blight appears.

MR. LANNIN: Will these germs grow in the peach tree?

J. C. ARTHUR: I got no blight in the peach, but got a peculiar gummy growth. The germs grow in the peach, but do not kill the tissue.

MR. LANNIN: Is there any prevention?

MR. ARTHUR: No, sir; you can do nothing to restore it. Theoretically an antiseptic might have some effect, but the germs are most likely to enter in a wet time when any application of that kind would be likely to wash off.

E. MOODY, New York: We have whitewashed with lime and sulphur and have had no blight for five years.

J. C. ARTHUR: I do not see how the washing of the trunk of the tree or the application of anything to the roots can have any effect on the pear-blight. Sulphur is a specific against bacteria, but you have got to bring it in contact with them.

MR. MOODY: One can smell the whitewash for a month. We haven't lost a half dozen trees by blight in over ten years, while others in our neighborhood have been troubled with it.

J. C. ARTHUR: If by any process you can induce your trees to grow slowly, you will to a large extent prevent the introduction of the blight.

MR. MOODY: I would as soon burn my orchard as seed it down.

W. C. STRONG, Mass.: Can we fumigate? will the fumes of sulphur do any good?

J. C. ARTHUR: It is doubtful if they would do any good in the open air.

The Secretary then read the following note on the

GRAPE ROTS.

By Prof. T. J. Burrill, of the Illinois University.

Our knowledge of the fungi which destroy

the grapes to so great an extent in this country, has hot been materially increased during the few years past. Fortunately the process of bagging the bunches while these are still very young, provides a method of securing the fruit against all these parasites, whatever their names or life-histories.

I wish, however, to call attention to the fact that what the French call *anthracnose* of the grape exists also in the United States, and is probably widely distributed. No doubt it is an importation from abroad and we may suppose that the disease producing fungus has reached our country during recent years. It was first observed by one in Central Illinois in 1881, and has not until this day been identified, to the best of my knowledge and belief, by anyone else. But it certainly devastated our vineyards before the date mentioned, and is now known to occur over wide areas of our country. I have found it in Illinois in numerous localities, in Indiana, near Indianapolis, in Michigan, at Lansing, and in Ohio, at Cleveland.

On the other hand Dr. Engelmann, after having had his attention called to the matter, failed to find the fungus or its characteristic effects in Missouri, and Professor Trelease, in a paper upon grape rots in 1884 does not mention this one. It could hardly have escaped the observation of this latter gentleman, had the peculiar fungus been common in Wisconsin, at the time.

Without further discussing origin and present distribution a short description of the disease is here offered.

With most persons grape rot is grape rot, without a thought as to the possible existence of several kinds. We must here, however, carefully discriminate between four distinct kinds, each produced by distinct fungus parasites. On the fruit, two of these are first observed in circular spots clearly marked and sharply defined at the edges. The other two affect from the beginning the whole berry, causing change in color—usually pinkish—and ultimately uniform shrinking, or rotting. Of the two latter, one fungus lives entirely on the outside of the leaves and fruit, having a thin cob-webby growth and two kinds of spore fruits. The other sends its vegetative filaments through and through the tissues, and at length produces on the surfaces of leaves and, less often, berries, what appears to the naked eye a white mealy substance usually in clusters or irregular spots. This last is far the more common of the two. It is *Peronospora viticola*. The first is *Uncinula spiralis*.

But so far as my observations go, neither of the above cause so much damage to the fruit directly as those to be described. They are primarily leaf parasites, and as such may be seriously destruction without actually preying on the berries. The two kinds beginning with well marked spots on the fruit are, however, specially injurious to the latter rather than to other parts of the vine. Upon close observation these two can be easily recognized, the one from the other. One is a true rot, the other simply kills the outer tissue as in the so-called scab of apples. In one case the first indication of the disease in a grape berry is a small brown spot, usually with a minute central lighter dot or point. As the disease progresses the brown area enlarges, the skin for sometime remaining plump and unbroken. The inner substance becomes watery and merits the term rot. Finally the whole fruit is involved and shriveling soon occurs. During this time if one looks closely, especially with a magnifier, minute black pustules can be seen pushing out from beneath the skin. Each one of these has at length an external opening or mouth from which issues as the fruit shrinks myriads of white spores. These latter may be seen in little heaps or scattered like a whitish powder on the shriveled berry. We have in this the fungus whose name, *Phoma uvicola*, has become well-known to lovers of the grape. It is undoubtedly the most destructive of the vegetable parasites of the vine. It does occur on the leaves, but not commonly, nor to an injurious extent except in rare cases.

We have now left the special disease which prompted this writing. As said above the effect on the fruit is, like the last, first seen in a definite spot or circular area with well defined edges. At first this is a mere point, then gradually increase, in size so as to cover one-sixth, one-fourth, or even one-half the total surface area. More often there are several small spots which more or less coalesce as they enlarge. At first, and while the spot is very small, the color is whitish, but as the affected area increases, the central part becomes blackish, while near the

edges the white color is retained as a rim which is also slightly raised. Only the surface is affected. The tissue just beneath remains green and apparently healthy. But growth is prevented. The affected area becomes apparently sunken by the increase in size of the other parts of the berry. Sometimes the seeds, perfectly developed, push partially out of what should have been the pulp of the fruit. Often the deadened surface cracks more or less deeply, altogether similar except on a smaller scale to that of scabbed apples and pears.

Really, however, the worst effects are produced on the green shoots of the vine, where spots like those of the berries are to be seen, often very numerous and conspicuously injuring the growth. Similar effects occur on the petioles and larger veins of the leaves as well as on the tendrils and stems of the fruit. In all cases the disease is worst in damp situations. When branches of the vine straggle over or near the ground among weeds, etc. During rainy weather they become extensively marked with the characteristic spots.

The disease can be readily transferred artificially from an affected to a healthy berry. It is only necessary to wet with water a diseased spot, and after stirring with a little brush, remove some of the water to a healthy fruit where it may stand as a little drop. If this is done when the air is saturated with moisture, failure to communicate the disease rarely happens. If quite dry only an occasional experiment is successful. With the microscope the minute spores are easily found and their germination and penetration of the healthy skin can be watched. This disease has long been known in Europe, and sometimes does great damage. More recently our *Phoma* has also gained introduction to the vineyards of the Old World. We have therefore exchanged parasite for parasite to the detriment of both countries. Scientists know the European fungus by the name of *Sphaceloma ampelinum*.

The methods of preventing all these forms of rot are similar. What is required is to keep dew, rain, etc., off the parts liable to attack. The spores of these fungi do not germinate on dry surfaces, no more than grains of corn germinate on a dry floor. Bagging does this and more besides, for the spores are kept entirely off the berries. The success attending bagging is an excellent popular demonstration of the fact, well-known to the specialist from other sources of knowledge, that these fungus parasites always start on the surface, are never carried in any manner in the circulating sap. Roots are seldom affected because so well protected in the soil. Partial protection is secured by training the vines under projecting eaves or other shelter, and good results are reported from the use of one or two wires, high up from the ground, along which the vines are closely grown, the leaves compact and roof like. The fruit hangs beneath and is considerably protected from falling water, while the radiant heat from the earth intercepted by the foliage prevents the condensation of dew. At the same time good ventilation is secured by the height of the vines and the open space beneath.

Good results are also reported, especially with *Anthracnose* by systematically and persistently removing and burning affected portions of the vine. This must, of course, be done for the whole vineyard, and in case of near neighbors for all alike.

Secretary Beal next presented the following:

THE MILDEWS OF THE GRAPE-VINE—AN EFFECTUAL REMEDY FOR PERONOSPORA.

By C. V. Riley, Washington, D. C.

There are very many fungi known to attack the Grape-vine, as is evidence by a glance at such works as "Funghi parassiti dei Vitigni," by Dr. Romueldo Pirotta (Milan, 1877), or "Die Pilze des Weinstockes" by Felix von Thumen (Vienna, 1878). But the two principal fungi, both of them popularly called "Mildews," which interest the grape-grower on account of the extensive injury they cause, are the Uncinula spiralis (Berkeley & Curtis) and they Peronospora viticola (Berkeley). Any popular statement in reference to Grape-vine Mildews in order to be accurate must take cognizance of these two species, which occur ordinarily under opposite atmospheric conditions. Failure to do so has wrought much confusion in the fugitive literature on the subject. As popularly distinguishing terms it would be well to call the former the "Powdery Grape-vine Mildew," and the latter the "Downy Grape-vine Mildew."

It is my purpose here to deal chiefly with the latter, but it will be desirable first to briefly consider the characteristics of the former that the

differences between the two may the more readily appear.

THE POWDERY GRAPE-VINE MILDEW.

This is the *Uncinula spiralis* (Berkeley & Curtis), and the conidial form has long been known by the name of *Oidium tuckeri*.

General Appearance.—This particular fungus produces a white powdery appearance on the upper surface of the leaves which at first looks not unlike dust, and which is much less conspicuous on the lower surface. Beginning in spots, these grow larger and larger until they cover the whole leaf and include even the young stems and berries.

Structural Characteristics.—The powdery spots consist of mycelial threads attached to the epidermis of the leaf by suckers. These filaments have a diameter of .004 mm. Portions of this mycelium rise up from the surface of the leaf, and become constricted or intersected, thus forming cells. As these cells, which are the conidial spores, multiply, the terminal ones enlarge, ripen and drop off, so that a succession of conidial spores is formed. The spores germinate at once by pushing out a germinating tube, generally at one end.

Late in the summer and autumn the perithecia and asci are formed, ripening about the first of October. These are the resting or winter spores and are small black bodies occurring on both surfaces of the leaf and on the stems. They consist of an opaque sac with a cellular wall, from which a number of appendages radiate to from three to five times the length of the diameter of the perithecium and some of them either ungulate, or spiral at tip. The perithecium measures from .07 to .12 mm. in diameter and the number of appendages varies from 15 to 32. Inside the perithecia are the asci or sacs which contain the spores. The asci vary from four to eight in number, nominally six; the spores also vary in number, the average being six. *Uncinula spiralis* therefore appears in two phases—first as a white flocculent mold, secondly as perithecia with more or less uncilate, or spiral appendages.

Variation in Habit.—One of the most interesting facts in connection with this fungus is that only the conidial form, known as *Oidium tuckeri*, occurs, or is so far known, in Europe. There is some question as to the actual specific identity of *Oidium tuckeri* as found in Europe and the conidial stage of *Uncinula spiralis* as found in this country. The bulk of opinion is that they are identical. We have in fact in this case one somewhat parallel to that of the Grape-vine Phylloxera. The gall-making form of this insect upon the leaf is of very common occurrence and the form most easily observed in America; whereas in Europe the species very rarely produces the gall. Yet the historic evidence is conclusive as to the introduction from America, both of the Phylloxera and the Oidium; and to my mind they both furnish admirable illustrations of a change of habit in an organism sufficiently marked that without the historic evidence the question of the exact specific identity of the parent and its trans-continental issue might well be raised. The interesting question, philosophically considered, is why, if the winter spore is necessary to the perpetuation of the Uncinula in America, the species can propagate for an indefinite period without it in Europe?

Effect on the Vine.—This fungus is less injurious to our hardier native grape-vines than to the European *Vitis vinifera* and hybrids with this last. Hence, it is more to be dreaded in California and in Europe than in the eastern United States. It also prevails most in a dry atmosphere.

Remedies.—Sulphur is well known to be one of the most satisfactory remedies against this fungus and is in universal application where the disease prevails. It is generally applied dry by means of a bellows, though, it seems to me, the wet method would have advantages with the use of the cyclone nozzle.

Mr. A. Veitch, of New Haven, Conn., has found that in green-houses the sulphur may be advantageously applied by mixing it with linseed oil to the consistency of paint and brushing it on the flues or hot water pipes. Mr. Wm. Saunders, the horticulturist of the Department of Agriculture, has for many years used, with great satisfaction, a weak solution of lime and sulphur obtained by pouring water on one-half bushel of lump lime and ten pounds of sulphur and then diluting for use.

THE DOWNY GRAPE-VINE MILDEW.

General Appearance.—The other Mildew, namely, the *Peronospora* shows itself on the underside of the leaves in the form of a small

patch of whitish down, and sends its mycelium into the adjacent tissues, destroying the parts which scorch and turn brown as if sun-burnt. It has been known by various popular names as "Blister of the leaf," "Blight" and so on. It generally escapes attention in its earlier stages, and experience shows that it is most destructive where the dews are heavy, or in continued damp, rainy weather. This particular Mildew is the *Peronospora viticola* (Berkeley & Curtis) De-Bary, having been first referred to as *Botrytis viticola*.

STRUTURAL CHARACTERISTICS.—The mycelial threads or hyphæ are about .01 mm. in diameter, somewhat larger in the stems and petioles than in the leaves. They are found everywhere except in the wood proper, but particularly in the tissue leaves. Their contents are granular and somewhat oily and cross partitions so characteristic of the *Uncinula* are rare. Just beneath the stomata of the leaves the hyphæ are particularly abundant. Those which are to bear the conidia pass through the stomata and grow more rapidly than the rest ramifying and reaching from .2 to .6 mm. in height, and bearing the conidia on the tips of the branchlets. The conidia are oval and obtuse, varying in size from .012 to .03 mm. in diameter. Germination takes place with great rapidity whenever there is sufficient moisture. Conidia placed in water, becomes swollen and somewhat segmented in an hour. The segments become oval bodies, collect at the distal end of the conidia, rupture the wall in a short time and escape, swimming off as zoospores, each with two ciliæ. Each conidium produces on an average five or six zoospores though the number is quite variable. They vary also in shape, and from .008 to .01 mm. in length. They move about from fifteen to twenty minutes; then come to rest, when the cilia drop off, and new mycelium develops from the side.

The winter spores or oospores are found in September and October in discolored and shriveled parts of leaves. They are spherical; .03 mm. in diameter, with a thick, smooth, yellow cell-wall. They fall to the ground with the leaves and lie dormant till spring.

So far as I can find the actual steps by which the winter spores are produced have not been observed in this species, nor for that matter in the *Uncinula*, but as the process is known in the order Perisporiaceæ we may confidently assume that they result later in the season from the union of the contents of two cells or hyphæ, *i. e.*, they are of sexual origin.

We thus have as in the *Uncinula*, both summer and winter spores. The summer spores develop outside the leaf and germinate rapidly as soon as they are moistened by rain or dew. Consequently during a wet summer the spread of the fungus is extraordinarily rapid so that within a few days a large vineyard becomes infested.

The winter spores are found in the interior of the dry leaves and hibernate within those on the ground. In summer they again get on to the young leaves by the agency of animals, wind and rain.

REMEDIES.

Sulphur as a means of checking or remedying this particula mildew has proved a failure, and indeed no satisfactory remedy has until recently been found, though prophylactic means such as those recommended by Mr. Wm. Saunders, namely, the sheltering of the vines by a board covering over the trellis, has been more or less successful.

The fact that no satisfactory remedy existed until lately was well illustrated by the discussion followed the reading of a paper by Mr. F. S. Earle at the meeting of the American horticultural society at New Orleans last February, on "Fungoid Diseases of the Strawberry."* The concensus of opinion was that we have no remedy for most of the fungus diseases of plants. That this was, unfortunately, a true state of the case, practical cultivators will admit: for, though intelligent treatment will check the growth of the black-knot and the proper use of lime and sulphur will check Erysiphe and Uncinula these are about the only fungus diseases which we can control with satisfaction and certainty. Prof. G. C. Caldwell is reported to have stated about a year ago at a meeting of the New York Horticultural Society that mildew could be prevented by soaking the stakes in the vineyard in a solution of blue vitriol, but as that report does not specify which mildew was intended I know not how authoritative it is.

* Many writers on mycological subjects misuse this term "fungoid" (which means something not a fungus, but fungus-like) in speaking of true fungi or of a fungus disease.

During my visit to South France in the summer of 1884 I was struck with the prevalence of this downy mildew in most of the vineyards, and the French grape-growers around Montpellier felt far more anxiety as to the consequences of this *Peronospora* than they did as to the work of the Grape-vine Phylloxera. They feel now that with the aid of our American stocks they can control and defy this underground pest; but the *Peronospora*, which was a few years ago unknown to them, but which has been introduced with the American vines, has so far entirely baffled them, as, I believe, it has baffled our own grape-growers.

In an address which I had the honor to deliver before the Central Society of Agriculture of the Department of Herault in June, 1884, and which treated principally of insecticides and insecticide appliances I took occasion, in view of of the interest then felt in this mildew, to recommend the use of the following as a promising fungicide. The ordinary milk-kerosene emulsion prepared after the formula given in my late official reports as U. S. Entomologist, with from two to five per cent. of carbolic acid and the same percentage of glycerine, and then diluted in twenty to fifty parts of water to one of the emulsion and sprayed onto the under-surface of the leaves by means of a cyclone nozzle of small aperture so as to render the spray as fine as possible. The suggestion of the carbolic acid was due to the results obtained by Prof. Gustav Foet, Director of the Ecole Nationale d'Agriculture at that place. It was very gratifying to find this recommendation at once acted upon, and, up to the time when I left Montpellier, with satisfactory results. Reports of further trials showed also that this mixture so sprayed at once arrests the spread of the mildew. I was well aware of the difficulty of dealing satisfactorily with a fungus which may in a single night, with scarcely any warning, manifest itself all over a vineyard; but it is a great point gained to know how to check it, even if the knowledge may at times be of little practical avail in large vineyards. But much good nevertheless resulted, and "*Le Procede Riley*" was much written about in *La Vigne Americaine* and other viticultural journals a year ago.

However, the experience of the past year in France has furnished a remedy which, from all accounts, it is in every way satisfactory because it not only destroys direct, but acts as a prophylactic.

My attention was drawn some months ago to two articles by G. B. Cerletti published the 15th and 30th of August in the *Revista di viticoltura ed Enologia Italiana*, announcing the success of hydrate or slacked lime. My friends M. J. Leichtenstein and P. Viala, of Montpellier, the latter having charge of the Labaratoire de viticulture at the Ecole Nationale d'Agriculture de Montpellier soon thereafter communicated to me the discoveries made. M. Velicogna in a report in the *Actes et Memoires de la Societe imperiale et royale d'Agriculture de Gortiz*, for September and October, 1885, has also discussed the effect of hydrate of lime, at length, his formula being $2\frac{1}{2}$ kilogrammes of the lime (*chaux eteinte*) in 100 litres of water.

The general tone of the experience with this hydrate of lime is satisfactory, but that with a mixture of hydrate of lime and sulphate of copper is still more conclusive, and numerous communications to viticultural journals and to the French Academy attest the complete efficacy of the remedy. It has been the custom in some of the wine-growing parts of France to sprinkle lime and verdigris upon those vines which border on the roadside as a means of warding off depredators. It was found that vines so spattered were not infested by *Peronospora* while the rest of the vineyard might be attacked. This discovery led to further experiment.

Various formulæ have been given, but the most important articles are those by M. A. Perrey, in the *Comptes Rendus de l'Ac. d. Sc.*, October 5, 1885, and by M. A. Millardet in the same publication and reproduced in the *Messager Agricole du Midi* for November 10, 1885. From this last article I condense the following: dissolve eight kilogrammes (18 lbs.) of ordinary sulphate of copper, in one hundred litres (about 22 gallons) of any kind of water (well, rain, or river); in a separate vessel mix thirty litres (about $6\frac{1}{2}$ gallons) of water, and fifteen kilogrammes (about 34 lbs.) of coarse lime so as to make a milk of lime. Then mix with this the solution of sulphate of copper. These will form a bluish paste. Pour a portion of the mixture in a bucket or other vessel, throughly shaking it, and brush the leaves with a small broom, taking care

not to touch the grapes. There is no fear of any accident, not even to the most tender portion of the vines.

The treatment was made from the 10th to the 20th of July. At some points the operation was repeated a second time at the end of August, but without much advantage. It was therefore demonstrated that one application was sufficient.

The mixture when dry sticks very fast to the leaves. After the vines were treated there were several showers the beginning and end of August, also the frequent September rains, notwithstanding which the evidence of the efficacy of the treatment where no more than half the leaves were touched by the mixture could easily be detected That this remedy will prove effectual for the many other similar white mildews on other plants caused by Peronosporæ, there can be but little doubt.

The same fear of danger as to the effect of this fungicide on the vine and on the wine has been experienced in Europe as we experienced in this country in the early use of Paris green as an insecticide, and experience alone will settle the amount of danger there may be in the use of this new remedy.

BIBLIOGRAPHY.

I know of no one who has more fully recognized the practical bearings on the best method of dealing with these two fungi than Mr. Wm. Saunders. In the Report of the Commissioner of Agriculture for the year 1861, p. 495, ff. he has an article: "Remarks on Grape Culture, with reference to mildew, both on the native and foreign varieties," and in a number of subsequent reports as those of 1864, '65, '66, '67, '69, '81–'2, and '83, he has dwelt either at length or incidentally on the essential facts that the *Uncinula* is encouraged by a dry atmosphere and the *Peronospora* by a moist atmosphere. His experience will show that the nature of the soil or mode of cultivation has but little influence on the fungus and that protection from above as by covered trellis is about the best prevention of the *Peronospora:* also that grape vines with downy foliage are more susceptible to the *Peronospora* than those with smooth foliage. His experience is very well summed up in a statement of it furnished for publication in my fifth Report on the Insects of Mis-souri, p. 70 (foot-note).

Of the writers on the structure and development of these mildews Dr. Thomas Taylor was one of the earliest in this country and found the perithecium of the *Uncinula* on the European vine. His chief articles are contained in the Reports of the Department of Agriculture for 1871 and 1874, but are marred by confusion in both text and plates. For accurate details the student should more particularly consult the following:

W. G. Farlow, (whom I have mostly followed) "Notes on some common diseases caused by Fungi," (Bull. Bussey Inst. Vol. II, part II, 1877, pp. 106–114); also "On the American Grape-vine Mildew (*Ibid.* for 1876, pp. 415–425); Maxime Cornu, "Le Peronospora des Vignes" Paris, 1882; B. D. Halsted "The White Mildews" (Proc. 19th Session Am. Pom. Soc. for 1883, p. 87), and Wm. Trelease, "The Grape Rot," (Trans. Wisc. State Hort. Soc., 1885, pp. 196–199).

SUMMARY.

We thus have, indigenous to this country, two mildews that are more particularly destructive to the grape-vine:

1. The *Uncinula*, or the Powdery Mildew, flourishing most in a dry atmosphere, not particularly destructive to our hardier native grapes, and easily controlled by the use of sulphur. It develops chiefly on the upper side of the leaf and produces simple, ovoid summer spores and more complex and ciliate winter spores which are found upon both the leaf and the cane. Introduced into Europe many years ago it is only known there in the conidial form as *Oidium tuckeri* and works more injury than it does with us.

2. The *Peronospora*, or the Downy Grape-vine Mildew, which ramifies its mycelium in the substance of the leaf and even of the fruit, and develops most in moist or wet weather. It produces its summer spores on the underside of the leaf, and a winter spore in the tissues of the dry and fallen leaves. It is not amenable to sulphur but is checked by a diluted kerosene-emulsion in which a small amount of carbolic acid is mixed, but far more effectually checked, and even prevented, by a mixture of slacked lime and sulphate of copper. This should be applied early in the season, say in June, so as to act as a preventive; while the gathering and burning of the old leaves in winter time will assist. This species is more injurious with us than the other and is

especially troublesome on the European vines. It was first introduced into Europe in 1877, when it was found in Hungary, and has since spread through the greater portion of France, Italy, Switzerland, Austria, etc.

The President announced the next subject for discussion as

BEST METHOD OF PREVENTING FROST.

Prof. W. R. Lazenby, of Ohio, was called upon and said: I will consider first the comparative temperature of mulched and bare soil; second, the use of smoke.

In Central and Southern Ohio we are liable to have frosts when strawberries are in blossom. We always mulch in winter, and I have noticed that plants on which the mulch was allowed to remain, suffered most from frost.

To compare the temperature over the mulched and unmulched ground I took sixteen observations, with a self registering minimum thermometer, daily between May 17th and June 1st of last year. The average minimum over the straw was 43.2°; over the bare ground 46.4°. The greatest difference was 70. This year the average minimum over straw was 32.3°; over the bare ground 34.°, with a maximum difference of 3.5°. The mulch keeps the ground cooler by preventing both absorption and radiation.

Second, the use of smoke. Last spring the pipes in our greenhouse got out of order and the plants were in danger of freezing. We filled the greenhouse with smoke and the temperature was held above the freezing point, at the point at which the smoke had been applied, while the temperature outside went from five to twelve degrees lower. Too dense a smoke of tobacco-stems has injured the plants. I don't think we have much to hope from smoke in the garden because when we most need protection the air is clear and the smoke rises. In a damp time and with no wind the smoke might be of some protection.

J. B. Rogers, New Jersey: Ever since the time of Seth Boyden I have considered that the difference between mulched and unmulched land was from five to seven degrees. We, however, generally leave the mulch on very late in order to keep the plants back and so save the crop. With many varieties we lose a third of the crop unless we do this.

E. H. Scott, Michigan: I have given up using smoke for protection.

The Secretary then read the following

NOTE FROM F. K. PHŒNIX,

of Delevan, Wisconsin, in continuance of the general discussion of this subject:

I can hardly hope even to suggest anything new in regard to preventing harm or protecting from late spring frosts.

To prevent, I mention, 1. Selection of least frosty sites as on uplands, or by ponds or streams where fruit bloom is retarded or protected from sudden sunshine. 2. Choice of varieties most hardy in bloom and set. 3. Modes of management most favorable as covering strawberries, grapes and blackberries over winter with earth, manure or mulch, keeping them covered as late in the spring as proves safe. *To protect* fruit, bloom and sets from late spring frosts should not seem far away. 1. By covering low fruit plants with straw spread over strawberry, currant, gooseberry, etc. We have several times saved home gardens in that way with trifling expense. I believe four or five ordinary loads of half refuse straw will cover a half acre, and aside from the hauling can be spread in an hour with the teamster and two boys. The straw afterwards for mulch, manure or composting is worth a large per cent. of the whole cost. 2. By raising the surface temperature and creating currents of air to prevent frost settling. This can be done by burning brush, straw or other cheap fuel, by using chemical combustibles or explosives, and by garden engine streams or sprays of steam and smoke arranged to distribute over a given area How much vibration from noises it would take to scare off the frost devil I don't know, but noise in America is cheap. My suggestions are doubtless very crude, but if they serve to direct our splendid inventive genius in that direction my purpose will have been achieved. I most profoundly believe in human mastery and control of earthly elements and conditions. Give experimental science and society a tithe of the vast amounts of money and time, now wasted on dissipation and we shall see the mightiest improvements, not only in horticulture but in every other useful direction.

Mr. Morrill: A mulch put on in winter after the ground has frozen has paid in keeping

the plants back in the spring. Avoid stirring the soil, if there is danger of frost. Tile draining protects from frost by the aeration of the soil. I have seen in a field of buckwheat over the lines of tile a heavy dew, but no frost while the plants on the strips between would be frozen.

W. R. LAZENBY: The question of mulching the strawberry is one of latitude largely. In Southern Ohio we cannot hold back the strawberry. The ground does not freeze much, and the little frost is gone early in the spring. Until the last season I have always found wild flowers in bloom in February.

C. M. HOBBS, Ind.: Why are some varieties of strawberry plants more susceptible to frost than others?

P. M. AUGUR, Connecticut: One reason is that some hold their flower stalks above the leaves more than others.

The first paper on the next topic was then taken up.

METHODS OF CONDUCTING STATE AND LOCAL HORTICULTURAL SOCIETIES.

By L. B. PIERCE, of Ohio.

The world has had its periods of darkness and depression; of fanaticism, of superstition and religious excitement; its epochs of war and politics; its ages of gold and silver and bronze, of stone and clay and iron and brass; but it has never had a period when the home was so prominent as now.

To possess a home is the dominant idea to-day in thousands of hearts, and many a man and woman are toiling early and late to this end. Following close upon the heels of possession, is the desire to improve, to fix up and surround the home with as much of luxury and refinement as can be afforded.

In looking around for these accessories it has at last come to be found that nature furnishes many means of luxurious enjoyment in forms as beautiful as they are perfect, and that a home without a garden filled with fruits and flowers falls very far short of perfection. So general has become this desire, that in this country at least we may be said to live in the age of horticulture. Its written lore already fills many shelves in the world's libraries, and its conventions attract and interest some of the best minds in the highest social circles.

In reference to these conventions or horticultural gatherings I am invited to offer you some suggestions, and the programme divides the subject into two heads, viz: social and general.

The local horticultural society is, or should be eminently social. It is a meeting of neighbors and friends for discussing topics of mutual interests. In order that these discussions should be of the utmost benefit it is necessary that they should take place amid scenes that are most congenial to the topics discussed, and under circumstances of comfort and satisfaction. There is no place that so thoroughly meets these conditions as the homes of the members, and any horticultural society that holds its summer meetings in a hall in town very seriously cripples its means of greatest usefulness. The actual, practical application of principles is the end of all wisdom, and horticultural wisdom in particular, and the question resolves itself into this—"Do we find horticultural principles best illustrated up two or three pairs of stairs in a hot, unventilated hall at the county seat, or upon the farms and around the homes of horticulturists?" The membership of local horticultural societies is generally scattered over several townships, this calls for absence from home an entire day and provision for the noon-tide meal, and this necessity has resulted in the practice of bringing a lunch and spreading it upon a common table. Very many sharp criticisms and bitter sarcasms have been hurled against this practice, but it is founded upon the fact that we require dinner on horticultural days as well as on others, and a combination dinner seems to be the simplest way of meeting the difficulty. The main objection urged is that a society is liable to degenerate into a mere banqueting association, coming together for a grand orgie instead of an intellectual entertainment. The only way to parry this charge is to make the discussions and papers so plainly superior as to discourage and give the lie to any such assertions. This is not easily done, I admit, yet with a president and secretary alive to their duties, and thoroughly intent upon making the society a success much can be accomplished. Business like methods and attention to minutest details are as essential to making a horticultural society a success as they are in personal matters. If a meeting is to be held out in the country some miles from a railway station, it is

hardly worth while to appoint an essayist who owns no means of getting there, nor can it be reasonably expected that a school teacher or scholar will be very willing to prepare and read a paper during term time. Sometimes horticultural timber with a literary tendency is scarce and societies languish in consequence. It is customary in such cases to import speakers, but this is not generally practicable to any great extent, for the reason that persons liable to be invited to do this kind of work get more invitations than they can afford to accept. In the long run outside help does not help a society, as they learn to depend upon it and lose self-reliance. Rather than depend upon horticultural speakers from abroad, I believe it better for local societies to get home talent even if it is not strictly in the line of fruits and flowers. A talented preacher, an earnest school teacher, or a bright, wide awake school girl with a faculty for putting her ideas upon paper will often say or read something that will arouse a spirited discussion and make the members better men and women, if it does not make them more successful growers of turnips.

If you can interest and attract outsiders or chance visitors so much as to make them become voluntary members, their membership is worth to the society twice what it is if they join from urgent solicitation and pay their dollar grudgingly.

I know a township wherein is located a high school, whose teacher at one period, had a peculiar talent for bringing out all the literary abilities her pupils possessed. Many essays by her scholars were really interesting and thoughtful papers. The secretary of a county horticultural society interviewed some of these scholars —young ladies and gentlemen seventeen or eighteen years old—and induced them to furnish papers during the summer vacation. They were asked to make them as horticultural as possible, and in two or three instances topics were suggested. In due time the papers were read, the parents and friends went to hear them because interested in the society, and large accessions were made to its membership. The papers were published in the proceedings of the society, and editors of widely circulating metropolitan journals saw fit to publish extracts from the essays and set them floating upon an endless mission for good. The young people were surprised and gratified, and the ranks of horticulture were permanently recruited with earnest workers and well wishers.

The publication of the proceedings of the society is a strong incentive to the members to do their best. In all rural counties there are newspapers glad to publish the proceedings, if furnished by the Secretary in reasonably good shape, and generally they can be persuaded to put the type into double column forms and print two or three hundred copies per month for about what the press work and paper is worth. Some societies which I know get two hundred copies printed from a double column form six and one-half inches long for $25, with covers thrown in. Others have to pay $30 or $40 for the same work, the total pages of the year's proceedings being about seventy. The binding at the end of the year costs about $1.40 per hundred volumes extra. The value of this horticultural literature, much of which is slowly and laboriously put upon paper by hands little used to the work, is often underestimated by those who do it. As far as it is the experience of the workers themselves, a single page is worth volumes of theory. If an editor, whose eye passes over each week the whole volume of current horticultural literature, takes the trouble to make extracts from the often poorly printed and illy bound report of some unknown society, then that society can take it for granted that they are adding something to the world's stock of wisdom, and be encouraged to go on with the work they have begun.

The exhibition of fruit, flowers and vegetables should be encouraged to the greatest extent, for in no other way can erroneous ideas and theories be so easily corrected. In conclusion allow me to say that the organization and carrying on of a local horticultural society is no child's play. Somebody must do a large amount of earnest, self-sacrificing, hard work before such an organization gains sufficient popularity and standing to go it alone. None but those who have tried it know the obstacles to be surmounted. Even at this period of horticultural advancement, the aims and objects of such organizations are often misunderstood, and it takes a large amount of patience and good nature to put some communities right upon the subject. With an illustra-

tion in point I will drop this portion of the task assigned me. For two years and a half I had belonged to a horticultural society in an adjoining county, when they consented to hold a meeting at my home. It was a hot, dusty day in September, near the close of an eleven weeks' drought, and many of them had a good many miles to drive, yet they turned out to the number of nearly a hundred and held a rousing meeting. Many of the neighbors came in, and among them an old lady. She waited to see the thing through, and as the last carriage drove away remarked: "Well, I declare! what nice people they were, and what fashionable bonnets the ladies wore!"

State horticultural societies differ in many respects from local ones. They are popularly supposed to occupy a higher plane of usefulness than the county society. This is probably true in the State of Michigan, and very likely in some other States. State societies are in a measure representative bodies, and the scattered membership and distant points of meeting do away almost entirely with the social features of the local societies.

The officers, excepting the secretary, are largely ornamental. They sit at the head of the table when they visit local societies, and judge the fruits and flowers at such fairs as they chance to attend; they help to swell the list of vice-presidents of national associations, and when they pass to the other side of the river, we learn from their obituaries of their vast service to horticulture.

It is part of the business of a State horticultural society to sanction and introduce new apple dryers, new cider processes and new fruits; and of the long list of novelties that have been tried and found wanting, from the Prentiss grape to the *Large Robert* strawberry, I do not recall one that has not received high official sanction. In thus referring to the booming of worthless fruits, do not understand me as under-estimating the great work that has been done by representative horticultural bodies. Far from it. It was a very necessary and important task in the days when the fruit list was much smaller than it is now and important gaps needed filling, but now that it is an accepted fact that fruits generally do best where they originate, and that it takes years to decide their merits, the discussing, and fixing the status of myriads of unfledged bantlings offered in the catalogues is of minor importance.

Long records of the weather, of cold snaps and periods of drought, generally known as *ad interim* reports, are of much less value than formerly. The world is too busy to read weather reports eighteen or twenty months after the weather happened.

If you ask me what I would substitute in place of these methods, once so useful but which the world has now out-grown, I would answer in two words, Horticultural Extension.

I know not how it is in other States, but in the populous and wealthy State of Ohio with eighty-eight counties, over seventy have no local horticultural society. More than one-half the farmers in the State do not raise enough raspberries, currants, pears and cherries for home use, and not one in ten grows a decent supply of strawberries and blackberries.

Skipping the so-called non-producing classes, and the higher mechanics and artisans whose tables are generally supplied with the best the market affords, we come to a large and it is to be feared an increasing class who know but little of the delights of horticulture. To those of this class who live in the suburbs of villages the wild elderberry and stolen apples constitute the major portion of their fruit supply, while those who live in crowded cities either do without or buy that which is so nearly decayed that it ought to be condemned by the Board of Health. Go with me to Cincinnati, cross the Rhine and visit the Court Street Market, and I will more than prove my words. You will see dirty, ill-clothed women buying a penny's worth of bananas or pears so nearly rotten that you unconsciously find yourself looking for cholera microbes with the naked eye. They have passed at every street corner stalls golden with the fruits of California and the Mediterranean, yet they were not for them till the bloom had turned to blackness and the gold to dross.

No one will question the advanced civilization of Northern Ohio, and the beauty of its metropolis is in every one's mouth, yet it is here that the mutterings of a storm, that threatens soon to break, are now distinctly heard Here the blood-red flag of Communism is daily unfurled and the battle-cry of Dynamite is hourly spoken in the lowest dives by those whose homes are un-

blest inside or out by much—I might say all—that makes home desirable.

What is it to these residents of squalid homes that in the country around, the apple blooms upon a thousand hills, and scatters its snowy petals upon the door-yard grass of as many happy homes? What is it to them that the purple grape ripens its fragrant clusters upon millions of vines up and down Lake Erie's shores, or that car-loads of California fruits are distributed from Cleveland depots?

It seems to me that it should be the work of the horticulturists of to-day, not only to enlarge the consumption of fruit, but to teach to thousands who now know them not, the joys and lessons that come with its growing.

If we observe closely, we will see that nature herself looks with favor upon the surrounding of our homes with horticultural treasures. A single illustration must suffice. We plant a vineyard and mildew and rot and the birds rob us of our expected reward, but plant a single vine where its roots can nestle against the cellar wall, and train its branches upon the side of the house, and in a few years huge purple clusters by the bushel greet our eyes. The house may be ever so humble—but a shanty in fact—yet the seasons work just as faithfully, and our vine still blesses the autumn days with its wealth of fruit.

The Christian world has spent a mint of money in propagating its doctrines, yet it seems to me that one grand means of raising the degraded to a higher and nobler place has been over-looked.

If you can persuade or teach an Irish washerwoman that a grape-vine will grow beside her shanty as readily as a morning-glory, that a garden that grows cabbages and potatoes will also grow cauliflowers and strawberries, you have taken one step toward the millennium. You have got her and her family a step out of the beaten track, and this single step may lead her sons into lines of life that will crave neither the short-stemmed pipe nor the whisky bottle.

Toward bringing about this horticultural millennium I know of no more powerful engine than the State Horticultural Society, if used aright.

It has, or should have, the best minds in the State among its members: it has, or should have, a liberal appropriation of money.

What more could be wanted?

The methods I would suggest for the prosecution of its work are the same now employed by many church denominations, and the American Sunday School Union. I would pay the Secretary of a State Horticultural Society a salary large enough to command his whole time, so that he could devote himself entirely to the work in hand. Like an agent for church extension, I would have him visit and encourage weak societies, and establish new ones where there were none, and in every way possible work up a practical sentiment, in favor of employing and enjoying to the fullest extent all the beautiful and good that nature, with so lavish a hand permits to grow out of the ground.

A State horticultural society, like a State board of agriculture, should be aggressive in its work, pushing it wherever an opening permits, and not sit supinely down waiting for something to turn up.

Its reports should be up to the times, and if published promptly would secure ten readers where but one is secured if a number of months is allowed to intervene between the meeting and the published records.

The work that a live State horticultural society with one or more efficient local societies in each county can do, in the lines that I have briefly indicated, is great, and sooner or later will have to be done. Notwithstanding theologians have scoffed at all religion that is "led from nature up no nature's God," I believe there is an intimate relation between the good things of nature and the highest good in the heart, and that the quicker the pleasures and benefits of horticulture can be made part of the daily life of all, the sooner will come the day when no man will have to say to his brother, "Know thou the Lord." America's greatest poet, in one of his best efforts, ventures the opinion that

> "The groves were God's first temples. Ere man learned
> To hew the shaft and lay the architrave
> And spread the roof above them—ere he framed
> The lofty vault to gather and roll back
> The sound of anthems; in the darkling wood
> Amidst the cool and silence he knelt down
> And offered to the Mightiest solemn thanks
> And supplication."

I cannot, with Bryant's poetic genius, depict the temples in which the thoroughly civilized and

Christianized man of the future will worship, but, like the first temples, they will spring from the ground at the bidding of the God of Nature, and spread a welcome shade between earth and sun. Their branches will gleam with purple and crimson and gold, and beneath them green grass and beauteous flowers will spread like a velvet carpet, and the "solemn thanks and supplication" offered from these temples will be all the more earnest and fervent because it has been discovered that nature's most perfect productions may be the food and drink of the lowest and humblest.

The Chair then called upon Chas. W. Garfield, of Michigan, the newly elected secretary, for some words on this topic. Mr. Garfield said:

LADIES AND GENTLEMEN:—My heart and soul are in this matter of societies devoted to horticulture, and has been for years and I can heartily endorse almost everything Mr. Pierce has said about what was necessary for societies locally. But we need to get not only the men who delve in the soil, but also the farmers' wives, connected with the society, and then if there are children we want every one of them to become interested in the society. That which helps us at home the most is the interest we can develop in the whole family. If we want to get those in whose occupation we are most interested, we can do it best, by awakening an interest in their children. A man who plants, harvests, and takes to market a crop of corn, expends but little love on that which will be permanent in his home. But with the planting of a tree all the family may take a part, and as it grows thereafter, we find that that tree is a part of the family as much as each child, and about it the tissues of the home concentrate and hold them all together, and by and by they look upon that tree as one of the influences that has lifted them to a higher plane of living.

We of Michigan, wish to see the horticulture we are developing; in a word, all these things we like best, grow in the hearts of the families. We find that our best meetings are out in the country among the things we are talking about, where each person can take an object in his hand and talk about it. I am satisfied that the American society to do its most noble work must take up the threads of these local and State societies, and have them centre in the National organization, so that we shall feel a thrill of pleasure from the good work that is accomplished in other States, and so that they shall bear us up in what I call the noblest work the American society can do, the development of a hearty interest in local work, and the helping to form the best character for the work of life.

Mr. George Ellwanger, of Rochester, New York, read the following paper upon the same subject:

THE TOPIC, "METHODS OF CONDUCTING STATE AND LOCAL HORTICULTURAL SOCIETIES"

has been very recently treated so intelligently by the Massachusetts horticultural society, that I cannot do better than to direct attention to the transactions of that body, for the year 1884. This subject was ably discussed by the ex-Presidents of the society, than whom no abler men can be found.

The society in question has got through with experimenting, and in my opinion is the best conducted horticultural organization in the world. Its transactions contain some of the ablest papers and reviews on horticultural subjects to be met with. In these the rich experience which costs its members a life time to acquire, is always presented in a concise and intelligent manner.

In the perusal of important horticultural papers, both American and European, I have met with none which afford me more pleasure and profit than these.

Perhaps some of the members of the Massachusetts society who are present may have a word to say upon the subject. At any rate, all who are interested in this question will do well to read the transactions alluded to, which naturally are too long to quote, with the limited time we have to devote to the many other important topics under consideration.

The next topic was

LESSONS FROM THE WORLD'S EXPOSITION.

Mr. L. A. Goodman, of Missouri, opened the discussion with a paper which we have not been able to secure, in which he criticised the management of the Exposition for shortcomings, which were keenly felt by horticulturists who exhibited there.

In continuance of the same subject, T. T. Lyon, of Michigan, gave the following paper:

Perhaps to no recent effort of this character

can we, with greater appropriateness, apply the very trite adage—"Nothing succeeds like success."

Commencing at a very late period, to prepare for simply a Cotton Centennial, the work seems to have grown upon the hands of its projectors, more rapidly than did the means for its performance; while to have accomplished the task undertaken, within the time, limited as it was, may almost be deemed an impossibility—the more so, if we consider that those in control are supposed to have been without previous experience in operations of this magnitude.

That really surprising results were accomplished, within a very limited period, we fancy that no one who has looked carefully into the matter, will be disposed to question. That the enterprise would prove a financial failure—may perhaps have been foreseen by those experienced in the working out of other similar enterprises.

That, considered strictly as an exposition, it has been highly successful we most fully believe. The exhibits of the United States, as well as those of the several States, and of very many foreign countries, were exceedingly instructive and interesting displays of their natural, and generally of their manufacturing and commercial wealth; while we seriously doubt if the horticultural, not to say the pomological exhibit, has been surpassed or even equaled by any previous display; if indeed superiority were possible, save in a similarly sub-tropical locality and climate, and in winter—the season of the maturity of very many tropical fruits.

The contiguous territory south of New Orleans being mainly water; and that at the north, comparatively speaking, but thinly populated, the hope of a large attendance must of course have been based largely upon the ability to attract winter tourists from the north; but this class of visitors seem to have been unduly, and to some extent at least, unwarrantably discouraged, by the correspondence of dissatisfied visitors and exhibitors, and the unfavorable and sometimes even unjust comments of the press.

Considering the incompleteness of the grounds and buildings, together with very many of the exhibits, when the time for the formal opening arrived, it would, possibly, have been wiser to have deferred it; although it may, with much force, be claimed, that far more than enough was already in position, to fully employ visitors, till the remainder should be in place. Be this as it may, we may fairly suspect that the influence of this, with the concurring circumstances, aided perhaps by the unpopularity of certain persons high in authority, may have made all the difference between success and failure financially.

It must also be conceded that the railroad facilities were by no means adequate to the emergency; while the rates seem not to have been reduced comparably with the increase of business consequent upon the exposition; and the failure to provide facilities adequate to the handling of the large increase of both passengers and freight, must doubtless be attributed to a failure to apprehend the gravity of the occasion.

Only during our winter, (at which season very many of the tropical fruits are maturing) and in a climate mainly exempt from frost, can the long-keeping fruits of the north be brought side by side with the later maturing, luscious, but extremely perishable fruits of tropical regions—a juxtaposition here very satisfactorily accomplished; so much so that ample succession of varying exhibits was maintained, securing almost constant continuation or recurrence of pomological interest.

A similar recurrence or renewal of interest was also noticable in the exhibits of trees and plants; since, in this genial temperature, our more northern deciduous trees were soon betrayed into a forgetfulness of their usual habits; and, even more freely than those "to the manor born," ventured, even in February and March, to display themselves in their accustomed apparel for May and June; thus affording a slight opportunity to draw comparisons between the natives of the north, and those of California, Mexico, Guatemala, Jamaica, and tropical regions generally—an opportunity which, doubtless, would be short-lived, under the fervid sun of a Southern summer.

The wider range of horticultural exhibits, afforred, of course, scope for the employment of an increased variety of horticultural knowledge and experience. Yet the board of control, none of whom are understood to be experts in this direction, seem to have insisted on reserving to themselves the selection of judges in this department; so that, either from lack of material, or from a failure to comprehend what was needed,

there was an apparent failure in some cases to provide the requisite expert talent as judges; since from the lack of disinterested experts, familiar with California fruits, and their variations under special circumstances, the awards upon these were committed to residents of the east, as were also those from England and France; while the entire nomenclature of the probably more than 40,000 plates of fruits, that, from time to time, went upon the tables, was committed to four judges, residents of Kansas, Iowa, Wisconsin, and Michigan—a work, the satisfactory performance of which, in advance of the action of judges of award was obviously impossible: to say nothing of the fact that these gentlemen were almost wholly without experience with the great mass of sub-tropical and extreme western fruits.

To the credit of the promoters of this exposition be it said that, unlike certain previous similar undertakings, they seem to have, from the first, distinctly recognized the importance of horticulture, and especially of pomology; providing ample buildings and other conveniences; as well as a very large fund, to be distributed as premiums. Although we regret to say that the manner in which such premiums were parceled out, and the lack of a proper system of rules for the regulation of the nomenclature, as well as for the direction of judges of award, seem to us to be fairly open to criticism; especially when we consider the very large premiums offered, and the consequently strong competition to be anticipated.

Among the many lessons taught us, or at least more strongly enforced by our observation and experience here, are the following:

That the success of a variety of fruit, is only in a very limited sense, a question of either latitude or longitude; and that variations or exceptions in this respect become greatly exaggerated as we go westward.

That, going either southward or westward, a variety will, as the rule, become larger; but, at the same time milder in flavor, and (with accasional exceptions) less highly colored; till, upon the Pacific slope, the most sprightly eastern varieties, such as Newtown, Yellow Bellflower, and even Ribston, become either neutral in flavor, or positively sweet.

That the nomenlature of some portions of the south, and west, including that of the Pacific slope, as indicated by these exhibits, sadly needs revision and correction.

That something like the above, may also be said of the nomenclature of citrus fruits—oranges, especially; premising, however, that, if we may judge from these exhibits, their variability, when reproduced from seed, may prove to be confined within such narrow limits, that it may be worthy of consideration, whether it be not preferable to designate them by classes or families, rather than by names, as separate varieties.

That, while it seems altogether reasonable to expect the federal government, through its Agricultural Department at Washington, to collect and disseminate valuable information on the subject of pomology, as a branch of agriculture; if we may judge from its pomological exhibit at this exposition, it sadly lacks the expert talent requisite to the proper performance of this work. The inartistic finish, the worse than faulty coloring, and the not infrequent incorrectness to name, of many of the casts of fruit exhibited, seem hardly less than disgraceful, while the colored pictures were, in many, if not in the majority of cases, apparently the work of the commercial lithographer, with the exaggerations in size and color so common among productions from such sources, while synomyms, too frequently are made to do duty in place of the true names.

We see no remedy for deficiencies of this character, short of the dignifying of horticulture, and especially of pomology, as a distinct branch of this department, and placing these in charge of a person thoroughly competent to direct the operations therein, and furnishing him the means as well as the expert aid so needful in such matters.

In addition to these, and many other lessons taught by this exposition—failure as it has been alleged to be—it may be said to mark an era in pomology. The pine-apple, the banana, the guava, the lime, the lemon and the orange of Florida, have stood beside the cranberry and the crab of Minnesota. The apple of New England, as well as that of Europe, has blushed beside its paler, but more portly brother of California and Oregon: while cider of the Dominion has sparkled beside the effervescent pulque of our neighbors of Mexico, and the sponsors for all these varied

products have shaken hands together. Under the genial skies of a southern winter, they have come to better know and value each other; while, with the ever widening influence of the steamer and the railroad, has, at the same time, come the ability to mingle freely together, and to reciprocally load each others tables with even the more perishable of our pomological products.

We will not claim that this is the ushering in of a pomological millenium, although we do trust that it may prove to be a long step in the direction of that brotherhood of feeling, which we so commonly associate with the word.

The next subject under consideration was

NOMENCLATURE OF FRUITS.

By T. T. Lyon, of Michigan.

The law of Pomological Nomenclature is mainly an unwritten one, while the fiat which enforces its edicts is the public will. A parent arrogates to himself the right to name his child, but, as the penalty for an injudicious exercise of such right, the public, not unfrequently imposes upon it a pseudonym, which both parent and child vainly endeavor to suppress. The same condition of things applies, with similar, if not even greater force, in Pomological Nomenclature. While the vivacious Frenchman prides himself upon his Duchess d'Angouleme, the American chairman of our revisory committee writes it simply Angouleme; but the public, generally, doubtless with less regard for history, and perhaps for euphony also, has long since christened it—Duchess—a name, against the continued use of which, in this connexion, we strongly suspect the influence of even the chairman and his committee will prove futile. We mention this not to express a personal opinion upon the matter; but merely as an illustration of the fact that in Nomenclature, as in Orthoepy, while the author may be able, to some extent, to lead, if his path of divergence shall be discreetly chosen, he will do so all the more easily, and surely, if such leading shall be in accord with the public tendency, which is often decidedly mulish, as against efforts to change or reverse it. Within the last few decades pomology has been gradually assuming increased importance commercialy; and, as an incident of such change, the importance of a simple, direct nomenclature has come to be more clearly recognized, finding expression, two years since, in the Rules of Pomology adopted by this Society, at its meeting at Philadelphia. We trust the Society is not unaware of the gravity of this act. It has no means of enforcing these rules, save through its hold upon the respect and confidence of the public. These it can doubtless best retain by thoroughly carrying out the rules in its own practice, and bringing its records, discussions and catalogues to strict compliance therewith; at the same time, as far as practicable, encouraging a similar practice by its members, as well as by all others, in their writings, as well as in catalogues and fruit lists generally. Of course, in all this, care must be had, to institute no changes or elisions, that shall, in any degree, endanger the identity of varieties, while there may doubtless be names, in some respects objectionable, yet two sacred or venerable to be subjected to the proposed process.

This seems to have been the fear of our late venerable co-worker, Chas. Downing, who, however, in the course of correspondence, remarked that the process had not, in his opinion, been carried too far, (alluding to the revision of the catalogue) and that it might safely have been carried even farther, as he thought it probably would be in the future.

What classes of names are to be preferred for fruits may fairly be regarded as an open question, We esteem brevity as always and everywhere desirable. The name of the originator or introducer will rarely be found inappropriate; and the same is true of the name of the place of origin, while either will generally possess the advantage of requiring but a single word; while the wish to add a characterizing word, but too commonly finds expression in the use of such titles as pippin, pearmain, superb, favorite, or Beauty, or of political or military designations, designed to convey the impression of superiority, but which have been heretofore so loosely employed, that they have, to persons of experience, at least, long since ceased to convey the impression intended. We cannot too strongly insist, that more than a single word will rarely be found needful; and that, if characterizing words be employed, the strictest honesty in their use be rigidly adhered to. If (as we infer should be the case) it be the purpose of the society to adhere strictly to its rule respecting objection-

able names, it would seem necessary that, upon the presentation of a new or newly named fruit for consideration, its *name* be, in all cases, first considered; and, that, it objected to, such objection be submitted to a vote of the Society, or referred to a committee; and that, if the objection be sustained, the fruit in question be designated by the name of the originator or introducer, or that of its locality, pending the designation of a satisfactory name by the proper person."

The following note from J. J. Thomas, of Union Springs, New York, on the same topic, was read by the Secretary:

According to request, I give the following brief suggestions on Nomenclature, for the Grand Rapids meeting:

There are two great foundation principles in nomenclature: to insist on compact, expressive, and appropriate names; and to give to Pomology the truth and dignity of a science, and to prevent it from becoming degraded into peddler's puffing.

A name may designate the locality of origin, name of the originator or of an eminent pomologist, (not of a politician or warrior) and still better an indication of its appearance or other characteristic.

It should not be somebody's "prolific," or "giant," or "favorite"; not a superlative, bombastic, frothy or strained name.

For strawberries, such names as Crimson Cone, Necked Pine, and Red Alpine, are much better than Wizard of the North, Great American, Defiance, Mammoth, Monarch of the West, etc., etc. Golden Cap Raspberry is to be preferred to Pride of the Hudson. Nivette and Lemon Cling are better than Admirable, Incomparable, Royal George, or Stump the World.

T. T. Lyon then offered the following resolution, which was read and referred to the Committee on Resolutions, and subsequently reported favorably and adopted by the Society:

Resolved, That, in all cases in which new, newly named, or recently introduced fruits shall, for the first time, come under the consideration of the Society, it shall be the duty of the presiding officer, to first submit the *name* of the variety, for approval: and that, if objected to, the variety shall be designated, by the name of the originator, that of the introducer, or of the place of origin, as the Society shall direct, pending the designation of a suitable name, as provided in Rule 2d, Section 1st, of the Society's rules: and the approval of such name by the Society.

The next subject on the programme, was entitled

NOMENCLATURE OF RUSSIAN FRUITS.

By Charles Gibb, of Quebec.

The American pomological society has been the guardian of the nomenclature of our fruits. This has been the special duty of the society, since its organization. What l'Academie Francaise has been to French literature, to a certain extent has this society been to American Pomology, so that the society's catalogue is "authority," and her dictum acknowledged over a wider area than any other society in the world.

Of late, however, one foreign element has come in, which has not yet received the society's attention. Large importations have been made from Russia. These fruits have been progagated in this country under names under which they were received; Russian names spelled in all sorts of outlandish ways, or translations often either unmusical or wholly wrong.

The first large importation of Russian apples was that of the Department of Agriculture at Washington in 1870, from Dr. Regel, of St. Petersburg. The list which was received with the trees was sent by Wm. Saunders to the Russian embassy at Washington for translation, and internal evidence would seem to show, that it was dictated by a Russian, to a Russian or a German clerk. These names are rendered into English sounds from a foreign, not an English standpoint. Thus "ow" and "ou," are intended to be pronounced "on" or "off"; also, "ja" should be pronounced "ya." The Russian language is as musical as Italian, and when these names are properly rendered into English sounds, it will divest them of half their difficulty.

We should have a certain amount of uniformity in the spelling of these Russian names. We find in the department catalogue, schlenka, sclenka, sclonka, selonnœ, sclennœ, selonnin, sclanni, selomaja, for the word green. We find, scholti, scholtoi, schaltui, scholtœ, scholto, for the word yellow. The Russian language is rich in inflection, yet is not responsible for all these variations, and if I were to add to these variations the different renderings of those who have shipped orders to this country from different parts of Russia, we would have an approach to things as they were in England, two and one-half centuries ago, when Shakespeare was spelled in, I am

afraid to say, some say twenty-seven different ways.

The translation of these Russian names is often faulty. In the department list vasilin velikin is translated vasilis, largest. It should be Basil the Great. Pipka gorkaya is the bitter, not the "butter pipka. Skrishapel, evidently a German name which comes through the Russian, I am told, does not mean cross-apple. No. 231 solotoi arcad is the Golden arcad, different in name and fruit from the yellow arcad.

In Minnesota the Lieby is coming into notice on account of its hardiness. Teschanka, or rather Lejanka, I am told, means a lying down or recumbent form of tree, though the name Lieby but faintly suggests this. Yantarnœ is the amber not the Zantar apple. Tchushenka selonaya is not Green citron. Astrachanskœ skvosnœ is not Red Astrachan, but Transparent Astrachan. Romenskœ is translated Omensk. Repristœ Walis-onœ is translated Turnipy juicy seems to be the Rebristœ nalivnœ, or Juicy ribbed apple. Krimskœ nalivnœ is translated Juicy Krimtarter. It is true that the Krim, the inhabitant of the Crimea, as we would say, is a Tartar, yet Juicy Krimtarter is a strange compound and hardly suggests a Crimean apple.

Some of the German names, too, need to be amended. For aport herbst we have autumn orange, but aport does not mean orange. For Erdbeer-apfel or Strawberry apple, we have Red Calville. Suislepper is translated into the English (?) word Switzer. Some of these names are very puzzling. Anas-apfel rother is translated Red duck. They say it might be Anna's apple. Only in the sense of a tempting or endearing apple could it be called a duck of an apple. It may be the Ananas-apfel Rother of Regel, and why called "rother," when it has not a speck of red on it.

Such is the unsatisfactory nature of this catalogue, yet it could not be helped, for not only did the Russian embassy do its work badly, but it lost the manuscript and thus compelled Mr. Saunders to issue it in its present form.

Let us pass now from the importation by the Department, to those of the Iowa Agricultural College, large importations from different parts of Russia, around which our hopes so largely centre.

I have seen the original lists which accompanied three of these importations, viz: those from St. Petersburg, Moscow and Voronesh. In these lists the names are rendered from a foreign, a non-English standpoint, and each, from a standpoint of its own, causing great variation. I will give one instance, an extreme one. In the list received from the Academy at Petrovskœ Rasumovskœ near Moscow, "lietnaya," is spelled "Getnjaja," and in parenthesis as a suggestion as how we should spell it "latnyagh."

Owing to these many difficulties the apples of the St. Petersburg and Moscow importations, were until lately sent out by numbers, but mistakes always have and always will creep in when varieties are sent out and received by number. Later importations have been sent out mostly by name, usually by Russian name, though sometimes by translated name, and in some few cases by wrong names. The pipka ostrokonetchnaya was received from Moscow, and supposing from the manuscript that the word began with an "a" instead of an "o" it was propagated under the name of Astrachan pippin. This shows the necessity of going to the Russian original.

Another importation was that by Ellwanger and Barry, from Moscow, of about thirty-five varieties of apples, a list of which they kindly sent me. Each shipper has a version of his own, and the trouble is that the Zuzzoff of one importation is not recognized to be the same in name as the Jussow of another.

There is but one way of stopping all this confusion, and that is for this society to publish these lots of imported fruits, giving the Russian name and the name by which each variety is to be grown. This work can be done at once and without any serious difficulty.

Another work remains undone, a work for the future, and attended with a good deal of difficulty. In Russia, apples have been grown for centuries by seedling production. In some cases no doubt certain types, isolated from other types, have been more or less reproducing themselves from seed. Hence, Aport, Borovinka, Arkad, Arabka, etc., are names of families, rather than of individual varieties, and if we were to import Aport, or Alexander, from twelve different parts of Russia, we might expect to get several varieties, most of which, though not Alexander, were more or less like it.

Let me cite another case. Arabka has been

brought to this country from St. Petersburg by the Department, also direct from Dr. Regel, also from the Petrovskœ College, also by Ellwanger and Barry from another source in Moscow; also from Kursk, and from Voronesh. That received by the Department proved to be Duchess—a mistake. That received from Moscow by Ellwanger and Barry, and that from the Petrovskœ College at Moscow by the Iowa College, do not seem the same in growth; that fruited by Ellwanger and Barry does not seem the same in fruit as Mr. Budd and I saw on the Bogdan of estates near Kursk, nor like the Volga specimen which Dr. Fischer, of Voronesh, recognized as Arabka. It seems as though we had two, if not three, different varieties, among these six Arabkas; not counting that of the department which is a mistake. Besides this, Herren-apfel was imported by the Department from Dr. Regel, and by the Iowa College from two sources in Riga, and from Vilna. Herren-apfel is an Arabka. So that we have Arabka in this country from ten sources. Imagine the care that will be needed to prevent confusion.

Here lies the greatest difficulty in regard to the nomenclature of these Russian fruits, a difficulty, however, which will be overcome, in time, owing to the extensive importation and propagation carried on by the Iowa Agricultural College.

A minor difficulty allied to this is that of tracing to their source varieties that reach us in roundabout ways. Ellwanger and Barry, of Rochester, received, I believe from Rivers & Son, Sawbridgeworth, England, Peter the Great. There is no Peter Vilikin mentioned by Regel, nor in any Russian catalogue I have seen. Is this then the Petrovskœ, of Regel, which in the Department list is translated Saint Peter? Yet the Great Peter of Russia, he who built his city on the Neva was not a Saint. I have fruited Count Orlof, Grand Sultan, and Red Transparent from this source and find them all White Astrachan. Can I assume that I have fruited the Sultrn-apfel and Orlovskœ of Refiel? How unsatisfactory is conjecture.

There are two ways of dealing with foreign names of fruits. One is by translation, just as in Russian catalogues. I find Kentskaya Krasivitsa for Beauty of Kent, and Klapovka for Clapp's Favorite. The other method is to retain the name in the language of its native land, and thus give to it the universality of a Botanic name. This is the method coming into favor among European Pomologists, and I regret that we can adopt it, but in a very limited way. Names like Shirokolitchiko or Steklianka, Ostrokovskaya must not be admitted. We need names our farmers can spell and pronounce. On the other hand, let us beware of the fault of overtranslation. Titovka is a better name than Titus apple, and besides it points directly to its orgin, the hamlet of Titov, near Kaluga. Borovinka is a better name than Mushroom; Arcad better than Arcadian; Arabka than Arabian; Anis than Anisette; and Antonovka perhaps better than Anthony.

In conclusion I would say, that if we are to have no more stumps of the world or sucker states, then let us have no more vasilis largest or juicy Krimtarter; and let us have one way of spelling Antonovk, as we now have more or less one of spelling Shakespeare.

I trust this society will at once consider this matter and give to these Russian fruits the names they are to be known by on this continent.

The society took a recess until 2 P. M.

THURSDAY-AFTERNOON SESSION.

The following resolution was offered by Chas. W. Garfield, and unanimously adopted:

Resolved That Mr. Charles Gibb, of Quebec, be selected as an associate member of the general committee on nomenclature, and given the special work of revising and arranging the nomenclature of American importations of Russian fruits, and authorized to contribute the results of his work, as a paper for the fourth-coming transactions of our society.

The first topic of the afternoon was then taken up, namely:

THE INFLUENCE OF POLLEN ON THE FORM, SIZE, COLOR, AND FLAVOR OF THE FRUIT.

The subject was opened by W. R. Lazenby, of Ohio, who described some experiments made in connection with the subject under consideration, at the Ohio Experiment Station.

He said: The tests at the Station were confined to the strawberry. I shall give the methods in which the tests were made, and the results. Boxes open above and below, and covered with white-washed glass were placed over plants of Crescent seedling. When these plants were in full bloom, they were fertilized with pollen from Sharpless, Chas. Downing, Jas. Vick and other well marked varieties; the blossoms of the fertilizing kind, being rubbed gently over the flowers of the Crescent. All blossoms that appeared after the cross was made, were removed. As the Crescent is pistillate any fruit which formed, would be a cross. To be certain of this, some boxes were left, in which no pollen was placed, and there no fruit appeared. The same result was obtained in other pistillate varieties. The covering of perfect flowering sorts had little effect on the amount or kind of fruit.

These experiments in crossing, were tried last year and this. A year ago there was a marked effect produced by the foreign pollen in every instance. The Chas. Downing pollen communicated its characteristic shape, texture, and other qualities, and the same with Sharpless and Vick, so that any one familiar with the berries could tell by looking at the crop from what source the pollen came.

The results this season, which has been more favorable for strawberries, have not been so marked, though we have taken as much or greater care. There were no very marked resemblances this year between the berry and the variety which furnished the pollen.

Prof. Lazenby exhibited four pears grown by Mr. Post, of Columbus, Ohio, which seemed to show that pollen influenced the fruit. Two of them grew on a Vicar graft, in a Howell tree; one was a Vicar from the original tree, the other a Howell from a limb which had not been grafted. The two pears from the graft were intermediate in appearance and ripeness, between the others, and were supposed to have been modified by pollen from the remainder of the Howell tree which was in blossom at the same time as the gratts.

N. J. Coleman, of Missouri: Is this change through the influence of the pollen, or of the Howell stock on the graft?

P. Barry, New York: It is probably a mistake.

The following note on the subject was read from Mr. Crawford, of Ohio:

"Some months ago, at your request, I promised to write a paper on the 'Influence of Pollen on the size, form, color, and flavor of fruits.' So far as the strawberry is concerned I have had excellent facilities for making observations, and I have yet to find any good evidence that the influence of pollen extends beyond the seed."

In continuance of the discussion the following paper was read upon

THE FERTILIZATION OF THE STRAWBERRY.

By T. J. Burrill, of Illinois.

I am unable to detect any difference in the fruit of pistillate strawberries on account of the kind of pollen used for fertilization. Observations have been mainly made upon Crescent as grown in the field, and as tested in experimental plats. For the former pollen was furnished by Sharpless, Captain Jack, Wilson, and Glendale.

As an experiment, we planted in the spring of 1884, in a field, a half mile or more from other

strawberries two broken rows, one of Crescents and the other of twelve different hermaphrodite kinds. There were twelve Crescents, and twelve plants of another kind side by side, then an interval of about ten feet, (too little) and another dozen Crescents with another fertilizer. The last were selected for their marked peculiarities of color, shape, or quality.

Especial pains was taken with Sharpless and a wild variety having very small, dark-red, deep-seeded fruit.

In these trials it was easy enough to select individual berries, conspicuously different from each other, as is always the case, but it was not possible to detect the slightest tendency towards a resemblance of the pollen bearer.

A box of fruit from the vicinity of the wild variety spoken of could not be told from that of other Crescents grown on the same soil.

Other experiments more exact in their nature were attempted, but from one cause or another were not considered satisfactory.

I am well aware of the possible exceptions to be taken to the above trials.

The Crescent has some pollen of its own. The distance that pollen is carried is not always the same, and may be too great, in any case to make sure results in such planting as the above. I ought, hower, to say that in the same row, Crescents without a neighboring fertilizer produced conspicuously less fruit.

A paper was next read by the Secretary, entitled

THE INFLUENCE OF POLLEN.

By A. S. Fuller, of New Jersey.

In 1859 I commenced to raise strawberries from seed, partly for the purpose of producing new varieties, but principally to test certain theories then frequently discussed, relative to the value of the pistillate varieties. The late Wm. R. Prince, of Flushing, N. Y., claimed that the pistillates were, and must ever continue to be the most productive, owing to their unisexual character. This theory was certainly a very plausible one, but unfortunately it did not hold good when tested in the field and basket. In conducting my experiments during the year named and several succeeding ones I cultivated some of the most noted of the pistillate and staminate varieties known at that time. Among the former I may mention Hovey's Seedling and Prince's Scarlet Magnate. The latter was quite a large variety; berry very regular in form, nearly globular or slightly compressed, bright scarlet; flesh white, firm, not high flavored, but good. The Hovey is so much better known that I need not refer to its peculiar characteristics.

In cultivating these and other pistillate varieties I employed various staminates to supply the necessary pollen for fertilization. When I used the Boston Pine, a staminate variety, also raised by Mr. C. M. Hovey, to fertilize the flowers of the Scarlet Magnate and Hovey's Seedling I was unable to see that the pollen had any marked influence upon the size or color of the berries, probably owing to close relationship and great similarity of color and form of all three varieties, although at the time I imagined even if it was not really a fact, that the Hovey was less acid when the flowers were supplied with pollen from the Boston Pine, than from such very acid varieties as the Wilson's Albany. But when I employed such a distinct male variety as the Peabody for supplying the pollen, the effect upon the size and form of the berries was very marked and readily seen. The long neck, and deeply ribbed or coxcomb shape of the Peabody were characteristics that would be readily transferred by fertilization if any can be, by such a process. By employing varieties like the Peabody and Triomphe de Gand to supply pollen for such pistillates as those named, the influence can readily be seen to extend far beyond the seed, as we know theoretically that it must, but perhaps rarely noted because in ordinary horticultural operations we do not seek scientific truths with as much zeal as we do market values and profit.

It is to be presumed that every practical horticulturist must have observed that where pollenation fails in the strawberry the receptacle or fruit upon which the seed rests, or in which it is imbedded fails to enlarge or continue growth, and if all the pistils of the flower escape pollenation, not only the entire fruit withers away, but also the flower stalk even down to the very roots of the plant. I refer now to pollenation as distinct from fertilization, and use the term as an equivalent of cohabitation in the animal kingdom which does not necessarily extend to, or result in, impregnation. Simple pollenation may cause a responsive action resulting in the ripen-

ing of the pistil, and yet the effect of the pollen may fall short of actual fertilization; hence, the frequent occurrence of false or imperfect seed among all of our cultivated fruits, and sometimes, but less rarely among the wild ones.

I became so fully convinced at the time referred to that the influence of the pollen in the strawberry did extend, under favorable conditions, so far beyond the seed that it often changed the form, color and flavor of the fruit that I referred to the subject in "The Small Fruit Culturist," published in 1867, pages 44 and 45, and from which I beg to copy a paragraph or two, as some of our horticulturists appear to have overlooked what I said on the subject at that time. In speaking of the usual practice of planting staminate and pistillate varieties in alternate rows, I said: "I would suggest, whether it is not possible that variations may have been made on growing plants by the influence of the pollen from different varieties. It is generally supposed that no effect is produced except on the seeds, but as it is most conclusively proved in animal physiology that the female retains the effect of the first impregnation in her system for years, may not the same be true of plants, and the admixture or deterioration of one, and the improvement of another kind growing in close proximity be caused by the absorption of qualities, each from the other.

After referring to the effect of non-pollenation of the pistils, I said further: "If the strawberry seed was large enough to be readily examined, we should probably see a difference in color and form just as we notice in mixed varieties of corn. In the latter we can see that the influence of cross fertilization extends further than the seed, because its receptacle (cob) is often changed beneath the kernel to a color similar to that of the variety which produced the pollen." About the time I wrote the "Strawberry Culturist," 1862, I called the attention of several of my acquaintances to this subject of the influence of the pollen on the quality of the fruit, and their reports were so uniformly in accord with the results of my own investigations that I felt warranted in writing the following paragraph in addition to those already quoted, to wit: "It is often asserted that the Hovey is better when fertilized with one kind than with another, and may not this be true, further than that of being fully supplied with pollen."

Since making my first experiments for the purpose of determining the influence of the pollen on the strawberry, I have observed many instances of changes in the color, form and flavor of other kinds of fruits as well, which, as it appeared to me, were directly traceable to the influence of pollen, although it must be admitted that with our improved cultivated fruits we must expect an occasional reappearance of ancestral characteristics which may mislead us in attributing certain results to a fictitious cause. Still, when a branch of an apple tree generally producing fruit with a smooth skin bears russet apples, and we can find no other cause for the change but the close proximity of a tree bearing russets, we are inclined to believe that pollen has had something to do in producing the change observed. Because similar, or like results are not produced every year, only indicates that self fertilization is the rule with the flowers of such fruits as the apple, and it is only when the pollen of a particular branch or whole tree is less potent than that on a neighboring one that cross fertilizing occurs.

I doubt not that every observing, practical member of the American Pomological Society can call to mind many such instances of cross fertilization among our larger cultivated fruits as well as among garden vegetables, especially with melons and squashes, for with the latter the influence of the pollen is more readily seen to extend far beyond the seed than with such small fruits as the strawberry.

That our vegetable physiologists have given us very little information on this subject is not at all strange, for very few of them have ever had their attention drawn to it, and futhermore, the extent of the influence of pollen must be studied in the field and garden, and not in the laboratory or with dried plants and fruits. In a few of the more recent works of vegetable physiologists it is admitted that the influence of the pollen extends to the entire formation of what is commonly called the fruit.

Julius Sachs, in his "Text-Book of Botany," edition of 1882, page 495, says: "The increase in size of the ovary, which is frequently enormous (in *cucurbita*, *cocus*, etc., several thousand times in volume), shows in a striking manner

that the results of fertilization, especially in the carpels, placentæ and seeds; but very frequently similar changes result also in other parts. Thus it is the receptacle that constitutes the fleshy swelling which is called the strawberry, on the surface of which are seated the small true fruits."

Also on page 594: "But sometimes the large series of deep-seated changes induced by fertilization extends also to parts which do not belong to the ovary, and even to some which have never belonged to the flower." Among the plants so affected he mentions the fig, strawberry and mulberry.

Then, again, p. 900, he says: "The process of development brought about by fertilization or the union of the reproductive sells is usually not confined to the resulting embryo, but shows itself also in a variety of changes in the mother plant itself."

This is what I claim to have seen in conducting my experiments with the strawberry a quarter of a century ago; *i. e.*, the influence of the pollen extended not only to the seed and fleshy receptacle or fruit, but to the fruit stalks and the entire plant. Further investigations in the same direction have only confirmed my convictions in regard to the influence of the pollen reaching so far beyond the seed as to affect the fruit sufficient in many instances to change size, form, color, and even the flavor. In ordinarily practical operations it may not be of any great importance, but every fact in regard to such matters is of value in the hands of those who seek to know something of cause and effect in the cultivation of plants.

Thomas Wilde, of Michigan, in resuming the discussion upon the general subject, said: I have tested the crossing of strawberries in the manner Prof. Lazenby has described for three years with variable results. The influence of the pollen is not always certain, but I am sure it has occurred with me. I crossed the Big Bob with Sharpless and the color was changed to a bright rose color, and there seemed to be a change in form toward the Sharpless. The Kentucky was changed in color with the pollen of the Vick; Arnold's Pride with pollen of Primrose was not changed in color; Manchester was changed a little in shape by Sharpless, and the fruit was pale and soft, somewhat like both. As much as half of my experiments showed a change in either form or color. The flavor of Crescent is made sweeter by pollen of the Alpha.

J. L. Budd, of Iowa: A number of years ago, about the time Mr. Fuller was discussing this matter, I was in correspondence with him. We grew at that time a variety called Colfax, which was strictly pistillate, and was generally fertillized with either Wilson or Downer's Prolific, and a number of our growers thought they noticed a difference in the size, color and quality, depending on which of the two was used. Some fifteen years ago I tried some more definite experiments to determine this matter. I had several rows of the Colfax, an acid berry, and planted by one part of the rows the wild strawberry, by another piece about ten rods away the Wilson, by another the Downer's Prolific. Where the Colfax plants were fertilized with the wild strawberry they were small and sour, where fertilized by the Wilson larger and sour, where fertilized by the Downer's Prolific lighter in color, rounder and sweeter. These changes were perfectly evident. We now grow the Chas. Downing and fertilize with Downer's Prolific. The Downing does not do well self-fertilized, but needs more pollen; besides, we think the cross mrkes it larger and better in shape.

F. M. Hexamer, of New York, then read the following paper upon

CROSS-FERTILIZATION OF THE STRAWBERRY,

By E. Williams, of New Jersey.

1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16.

1st.—Supposing the odd numbers in the above figures to represent a row of perfect flowering varieties, and the even numbers four rows of a pistillate flowering variety; would this be a good arrangement to observe the effects of pollenating influence?

2d.—Would it be preferable to have one kind only of perfect flowering plants, or each row of a different variety?

3d.—What would be the probable result or effect in either case?

On the first day of July last, I had the pleasure of visiting a bed of this discription in Connecticut on the grounds of P. M. Augur & Sons.

The odd numbers represent single rows of the following varieties: 1. Cumberland; 3. Bidwell; 5. Seneca Queen; 7. Henderson; 9. Sharpless; 11. Dewey; 13. Great American; 15.

Piper—all perfect flowering or bi-sexual varieties.

The even numbers represent four rows of their seedling, "The Jewell," a pistillate variety.

In this specimen bed, the Jewell and Seneca Queen, appeared to present the most vigorous growth, both exceeding the Sharpless; while the Bidwell was not far behind, and was producing the largest crop of fruit I ever saw of that variety. The Great American was not half as vigorous under the same treatment, which it is fair to assume had been liberal.

This experimental bed of 38 rows, 35 feet long, was one of vast interest to me; affording, as I thought, a fine opportunity to study and observe the effects of pollenating influence. The quantity of ripe fruit in all directions was immense, the Jewell surpassing all others, in this respect.

My curiosity prompted me to examine the first plant of the Jewell before me, and count the berries on it; the result was as follows: 16 fruit stalks, 58 ripe berries, and 33 green ones; total, 91. More than a quart of ripe fruit on a single plant, at one time.

The next plant examined had 11 fruit stalks, with 50 ripe berries, and 30 to 40 green ones. Among the latter were very few, showing imperfect development. The pollenating seemed complete. I looked in vain for any visible evidence of the much talked of effect of pollenating influence as affecting shape, quality, etc., that some advocates of this theory pretend is so potent.

One gentleman present, a veteran of long experience and possessing an acute taste, thought he had discovered it in the varying color of the flesh, but repeated trials forced him to the conclusion that this was entirely due to the degree of ripeness.

In reply to my subsequent enquiry, he uses this language: "In regard to the potency theory I saw no evidence of it beyond the simple fertilization of the pistillate flower. The fruit was uniformly the same all the way through, except that the flesh varied in color as the fruit was more or less mature. There was no difference in character or flavor."

There was also present at the time, one of the foremost advocates of this theory, who has spoken and written freely on this subject, and however positive he may be, as to the conclusiveness of his own experiments, in this line, he certainly failed to detect, or point out any peculiar effects here, on what we considered an excellent opportunity.

Perhaps this may be accounted for, from the superabundance of pollen present, neutralizing the potential effects of any particular variety; or perhaps the Jewell may be less susceptable to this influence, or her good behavior and respect for such a promiscuous party of gay cavaliers prevented her from showing any partiality; be this as it may, the Jewells were Jewells in size and shape; Jewells in color and texture; Jewells in quality and flavor; and every other characteristic, in all parts of the bed, without regard to the pollen producing variety near it. I may say, however, that some plants were more productive than others; this is of common occurrence, but I will defy anyone to have selected a row of Jewells in the whole bed that he could positively assert was more productive than another.

Now I do not assert that the influence of the pollenating varieties do not sometimes extend beyond the fertilization of the seed. On the contrary, I believe it does. I believe the condition of the plant operated on, as regards vigor or vitality, is an impotant factor in permitting, feeling, showing, and developing this influence. I believe the fact exists, but we have not yet mastered the science of the thing, so that we can produce at will any permanent characteristic of a Bidwell on a Crescent, a Sharpless, on a Glendale, or a Vick on a Jersey Queen.

More, and often repeated experiments in this line, carefully conducted, than has yet been made, will be necessary, ere we can utilize and render available the benefits, if any, to be derived from the elucidation of this subject. Until we do this, the fact, if it is a fact, will remain as it is, a scientific fact of interest, nothing more, nothing less.

Remarks by F. M. Hexamer, of New York: These cases are no evidence that pollen may not have a direct influence. No amount of such evidence can counteract one case of direct evidence. Formerly it was the non-scientific who retarded progress, but there is such a thing as scientific men retarding progress, by refusing to recognize new truths until practical men have demonstrated them. Mr. Hexamer then referred to the well-known fact that in animals a male

will have an influence on the female, which may appear in the offspring for several generations afterward.

REPORT OF COMMITTEE ON FRUITS EXHIBITED.

To the President and Members of the American Pomological Society.

Your Committee on Fruits Exhibited report the following awards:

WILDER MEDALS—SILVER.

Michigan State Horticultural Society for 547 plates of apples, 23 plates of crab apples, 152 plates of pears, 68 plates of plums, 34 plates of peaches, 69 plates of grapes, 4 plates of raspberries, 4 plates of blackberries, 1 plate each of quinces, Japanese persimmons and cranberries; total, 838 plates.

Ohio State Horticultural Society for 56 plates of grapes, 34 plates of apples, 24 plates of pears; total, 114 plates.

Missouri State Horticultural Society for 146 plates of apples, 42 plates of pears, 20 plates of grapes, 3 plates of peaches; total, 211 plates.

Ellwanger & Barry, Rochester, New York, for 140 varieties of pears.

Benjamin G. Smith, Cambridge, Massachusetts, for 61 varieties of pears.

Peter M. Gideon, Excelsior, Minnesota, for 28 varieties of crab apples and apples of his own origination.

Field & Osborn, Red Bank, New Jersey, for collection of cocoanuts grown by them in Dade County, Florida.

In appreciation of the valuable and untiring services of Prof. Wm. J. Beal, our retiring Secretary, we recommend the presentation to him of a silver Wilder Medal.

MEDALS—BRONZE.

Henry M. Engle & Son, Marietta, Pennsylvania, for 28 varieties of pears, 27 varieties of grapes, 3 varieties of peaches, 2 varieties of apples, and a specimen of Great American chestnut worthy of special mention.

A. J. Caywood & Son, Marlboro, New York, for 3 new varities seedling grapes.

George W. Campbell, Delaware, Ohio, for 6 new varieties seedling grapes.

W. W. Thompson, Smithville, Georgia, for collection of pears, grapes, figs, Japanese persimmons and pomegranates.

A. Block, Santa Clara, California, for 4 new varieties seedling pears.

Prof. L. H. Bailey, Jr., Agricultural College, Michigan, for 75 plates of berries, nuts and other native fruits.

T. V. Munson, Denison, Texas, for 12 varieties of seedling and native Texan grapes; also plums and peaches.

HONORABLE MENTION.

J. Nimon, Denison, Texas, for 12 plates of apples, 4 varieties of peaches.

L. A. Goodman, Westport, Missouri, for collection of apples, pears and grapes kept two years in cold storage.

J. S. Owen, Saugatuck, Michigan, for Early Rivers peach.

S. H. Comings, St. Joseph, Michigan, for exhibit of cranberries.

OTHER EXHIBITS.

We also report the following exhibits:

J. J. Toon, Atlanta, Georgia, Edmund and Bartlett pears.

John H. Parnel, West Point, Georgia, collection of peaches.

O. M. Lord, Minnesota City, a new native plum, Rolling Stone.

John C. Ratliff, Richmond, Indiana, seedling pear.

Prairie Farmer, Chicago, Illinois, seedling plum.

E. W. Daniels, Auroraville, Wisconsin, 3 plates of apples, Northwestern Greening.

J. G. Kingsbury, Indianapolis, Indiana, seedling pear, Warner.

C. A. Green, Clifton, New York, Lord Nelson apple and seedling pear.

John S. Collins, Moorestown, New Jersey, 2 plates Comet pear.

Gideon N. Greer, Philadelphia, Pennsylvania, mangoes and alligator pears.

James Beltner, Riverside, California, Mediterranean sweet oranges, crops of 1884 and '85, mostly picked August 5, 1885.

H. S. Anderson, Union Springs, New York, plums, Shipper's Pride.

Bush & Son & Meissner, Bushburg, Missouri, 7 varieties of grapes.

Prof. A. J. Cook, Agricultural College, Michigan, 5 plates of apples.

G. W. Price, Turner's Creek, Maryland, peaches.

S. T. Jenkins, Baltimore, Maryland, grapes.

G. P. Peffer, Pewaukee, Wisconsin, 5 varieties apples and crab apples.

Niagara White Grape Company, Lockport, New York, Niagara grapes.

Daniel Duer, Millersburg, Ohio, 15 plates of apples.

E. T. Field, Middletown, New Jersey, new seedling apples.

Pratt Brothers, Rochester, New York, Empire State grape and New Brunswick apple.

Mr. Moahr, Grand Rapids, Michigan, Chinese lemon.

J. H. Tryon, Willoughby, Ohio, 3 varieties of grapes, 2 varieties of pears.

Jenkins, McGuire & Co., Baltimore, Maryland, fruit shipping crates.

Your committee cannot close their report without special honorable mention of the highly meritorious collection of 100 varieties of pears exhibited by our venerable friend and President, Hon. Marshall P. Wilder.

Although it was not his wish that it should come into competition with other exhibits, nevertheless, in consideration of its excellence, as well as of the invaluable services of the exhibitor to the cause of pomology, your committee unanimously recommend that the Wilder Gold Medal shall be awarded to it.

Respectfully submitted,

F. M. Hexamer,
A. W. Harrison,
Robert Manning,
J. J. Harrison,
T. V. Munson,
Committee.

Following this report, a paper was presented on

HARDINESS OF FRUITS,

By Chas. A. Green, Rochester, New York.

I am considerably interested in the hardiness of fruits. Therefore I often ask myself by what process does a variety become hardy and how is it that we expect hardiness in a variety originated north, and do not expect it in a variety originated south. I gain an insight into this subject by considering the similarity between plants and animals. Should I ask you to specify the distinctive difference between the animal and vegetable kingdoms, you would doubtless be puzzled in answering, for there are no functions of animal life differing from the functions of the plant life sufficiently to define definitely the dividing line.

The question of a digestive apparatus does not distinguish animals from plants, as some animals appear to have no digestive apparatus while plants and trees may in a certain sense be said to digest that which nourishes them: neither can the difference between animals and plants be established on the grounds that plants, vines and trees only can be propagated by cuttings, buds and scions, for there are animals that can be cut in pieces, each of which develops into a perfectly formed animal. It has been thought that the distinguishing feature is instinct. It may be that plants and trees are not possessed with instinct, but if they are not, what shall we say of the impulse that leads the vine to throw its tendrills in the direction of a support, and twine itself about it with the greatest tenacity? Or what shall we say of the roots of a vine that push out a long distance in the direction of a supply of food in the shape of a manure heap, or for a supply of water far beneath it, or to one side? Or what shall we say of a vine planted in a dark cellar which escapes from its prison and rears its head with pride into the sunshine above? If these are not evidences of instinct what shall we call them?

That plants have peculiarities similar to those of animals is apparent from the fact that there are organisms which scientific men are unable to determine whether they are plants or animals. The similarity between the habits of plants and animals teaches me that we may be aided in arriving at conclusions relating to the hardiness of fruits, by considering how animals are improved and made more hardy, also to improvement in other ways, and to treatment of diseases, as we have better physicians for animal than vegetable disorders. Therefore in answer to the question, "Where do the plants come from that are found in the north, and how came they possessed with hardiness?" I ask of whence came man and the beasts from such northern lands, and by what process did they become possessed with hardiness?

The birthplace of man and most animals was in a mild clime. Their march northward has

been by slow stages, occupying many thousand years, during which they have accumulated and inherited hardiness enough to withstand the climate of the arctic regions. The birthplace of the majority of fruits was likewise in a mild climate, from whence they have migrated throughout the ages. While plants are deprived of the peculiar methods of locomotion possessed by animals, they make free use of others' wings and legs, and of lakes and streams.

The seeds of fruits will usually remain in the stomachs of birds and beasts several days and finally be deposited several hundred miles distant from their birthplace without loss of vitality. Plants have thus and by other methods migrated north and south. Those plants best adapted to a northern clime that rove south, perish under the scorching sun of the tropics, but such as migrate north become more hardy as they progress northward. The gradual increased exposure is met by the response invariably given by plants and animals when placed in a perilous position, which is to fortify themselves against disaster. Thus the parent accumulates hardiness by gradually increased exposure. The offspring inherits the hardiness of the parent and acquires more hardiness from further exposure, until in the course of ages the hardiest varieties are obtained by natural processes.

This natural process is too slow for short-lived man, who seeks to hasten it by long leaps. Instead of occupying ages to remove a seedling from New Jersey to Minnesota, he transports it by express at the rate of forty miles an hour. The change of climate is too sudden and violent, and the result is that, like many other good things, the petted variety dies young,

Man seeks with more wisdom to import a variety to our northland that through long generations of gradually increased exposure has become hardy in foreign climes. While this meets with partial success we must remember that the inherited peculiarities of such imported varieties are not such as varieties inherit on our own soil. Therefore from our native stock must we look for our best success.

The next item on the programme was a paper upon

SMALL FRUITS,

By E. Williams, Montclair, New Jersey.

The term small fruits, as commonly used, is generally understood to apply to and embrace that class of fruits that grow on vines or shrubs, as distinct from the tree fruits, though literally speaking some of the latter are even smaller in size than some of the other class, so that the terms large and small, as used in this general sense, may be said to apply more particularly to the stocks producing the fruits than to the fruits themselves.

In extent of varieties, qualities, fruitfulness and general adaptation to the varying soils and climate of our country, ease of culture, early maturity and quick returns, this class of luxuries known as small fruits is, and deservedly should be, the most popular and universally cultivated by our people, and no farm or garden in the country should be without a generous supply.

From the standpoint of a producer and consumer, the essential elements this class of fruits should possess, I name as follows:

1. Constitutional vigor of growth.
2. Healthy and abundant foliage.
3. Hardiness in summer and winter.
4. Productiveness.
5. Quality; this should be good to very good, or best; if below good, as a consumer I have no use for it.

The sixth requisite I would name is marketing qualities—the ability to stand carriage. This with many growers would take precedence of the previous one, and where money is the sole object in fruit-growing this is one of the most important considerations, but I am a poor salesman to dispose of a fruit that I cannot commend for its goodness in other respects.

No mere money considerations should induce any one to introduce a new fruit unless it possesses some points of superior merits over those of the same class now before the public, and no true horticulturist would do it; and yet these prospective profits and money interests are often the most prominent inducements to allure purchasers, and, as a rule, the poorer the fruit the more prominent this feature is presented. These remarks will apply as well to our large fruits as the small ones.

This bill of requisites as presented above is short, containing but six counts all told, and at first glance it would seem no difficult task to fill it; yet, can any one name a strawberry or grape that will score the six points? If we cannot

attain perfection, let us approach as near it as possible.

If more attention were paid to these points, and less to the mere money-making feature, our fruit lists would be shorter, and many novelties of late years of no real merit would have died, as they ought to have done in the hands of their originators, and the purchasing public saved a vast amount of money, labor and disappointment.

Just here some Rip Van Winkle is probably ready to assert that, with all our enterprise, we have made no advance during the last fifty years. If I mistake not a Boston gentlemen of this kind has, within a year or two, asserted that we have no strawberry to-day superior to the Hovey of that date. If this were true, I should be sorry. Let us take a brief retrospective view and see how the thing looks.

I have mentioned the strawberry and grape because they are the most popular of the small fruits. In the fruit list adopted by this Society in '67, eighteen years ago, the strawberry list comprised 25 varieties, seven of which were pistillate, the balance perfect flowering varieties. In this list were five foreign varieties. In Lower Canada, Illinois, Iowa, Kentucky, Kansas, Minnesota, Northern Michigan, Missouri, New Hampshire, Nebraska, Ohio, Virginia and Wisconsin not a single variety was recommended for culture or trial even. Four of these varieties received but one star each, five but 2, two 3, three 4, two 6, two 8, two 9, two 12, one 14 and one 17, a total average of $5\frac{1}{4}$.

How does the case stand now. Our list for '83 contains 41 varieties, and but four of those that were in the '67 list, viz: Downer's Prolific, Hovey, Triomphe, DeGand and Wilson. But two of the list, DeGand and Jucunda, are of foreign origin. Now note the difference in the territory unrepresented: Dakota, Montana, Wyoming, Idaho, West Virginia, Nevada, Indian Territory, New Mexico and Arizona.

Our present list no doubt contains many varieties it ought not to, placed there through the efforts of persons directly interested in them, but these will soon drop out as their demerits become known; in fact, no list of this kind can be compiled that will accurately represent the diversity of views held by the great body of fruit-growers in our country, but it is an index or finger-board pointing in that direction. If this does not mean progress, what does it mean?

Why have all these old varieties been superseded? There is but one answer, and that is that the newer varieties have been found to do better. This list shows not only great progress in varieties, but a greatly increased area devoted to strawberry culture.

Look a moment at the grape list. In '67 our list comprised 30 varieties; 20 of them, just two-thirds, are to be found in our list of '83, which has been swelled to 51 by the addition of more new varieties than the entire list of '83 contained. This, too, indicates progress, substantial progress, too. The leading varieties ten years hence may not be the leading ones of to-day. A forward movement is taking place all along the line, and they who fondly stick to the Concord as the *best* grape in existence, with those who accept the Hovey as the ideal strawberry, unless they accept the facts as they exist, and join in, will "get left" most assuredly. To those most active in this movement, let me drop a word of caution not to overlook the fifth requisite I have named, but rather make it the polar star of their efforts.

The deterioration of our small fruits, and the causes thereof, is a subject of vast importance to cultivators everywhere, and the members of this Society can do no better service than to devote their best energies to a study of the causes tending thereto.

The leading strawberries and grapes of years ago were not discarded because they were supplanted in every case by varieties of better quality; but because they failed to maintain their character for healthfulness, hardiness and productiveness. The fruits excelling in these respects to-day will eventually follow in the same direction, many of them, at least, and from the same causes. Had the Isabella and Catawba grapes maintained the position they once held they would not long since have been discarded for other, and in many instances inferior varieties. It would be a difficult task indeed to supplant the Downing strawberry did it still retain the health and vigor it possessed when first introduced, but its liability to disease renders its decline sure and steadfast.

Why this lack of vitality in our small fruit plants? Is it due to the exhaustion of certain

elements in the soil that heretofore enabled the plants to obtain all the essential requisites for robust health and vigor? or is it due to enervating methods of propagation? Do the mutations of seasons or climatic influences contribute to these results? Are the rusts, mildews, rots, and other fungoid diseases of recent origin? or have they always existed in our midst, merely awaiting favorable conditions to make their insidious attacks and thwart the best efforts of the husbandman? These are questions easier asked than answered, but they are of vital interest to the small fruit-grower.

Small fruit-growing means work, and if it is not done at the proper time, more of it, much more. The profits attending the business are quite as varied and uncertain as in any other pursuit. Abundant supplies, low prices, the diseases heretofore mentioned, all tend to invest the business with uncertainty, much more so than formerly. From extensive observation and long experience, I would advise those contemplating engaging in it to proceed with caution.

If a person happens to obtain satisfactory results from a certain crop, the fact soon becomes known, and it is caught up and made the most of by a certain class of plant venders who hope to advance their interests by this means.

If fruit-growing was the profitable business they represent it to be, their opinions would have more weight if they paid more attention to it and less to selling plants, which is no doubt often the main, if not only source of profit, they derive from the business.

If a dozen fail in making small fruit-growing profitable you seldom hear of their failure. It is not the profit of a single crop or a single season, but a series of them, year after year, that makes the business a satisfactory success. Sometimes the grower's reputation and the customers he has gained after a long series of years constitutes just the difference between profit and loss. Another grower with equally as good fruit, but without the reputation, experience and customers, might be compelled to dispose of his crop at a loss. As in any other business the few find the profits, the many meet with fair or indifferent success. The elements of success are more often in the individual than elsewhere.

While all our large markets afford a limited demand for a certain amount of fancy fruit at fancy prices, this demand of late years has been more than supplied, and prices have ruled low, so that many a consignment has resulted in loss and dissatisfaction to the grower, which, if placed in a local market nearer home, would have given better satisfaction. "Distance sometimes lends enchantment to the view," even in fruit-growing.

The past season the strawberry crop in New Jersey probably did not average over one third the usual amount, yet there was hardly a day during the season when strictly first-class fruit could not be had in our markets for ten and twelve cents per quart at retail, with inferior but fair fruit down to five and six cents wholesale. With this state of things and a light crop, what would it have been with a maximum yield? If growers can extract any profits from such figures after paying expenses, they have a happy faculty I do not possess Those entertaining opposite views may claim that I have cited exceptional cases of overstocked markets.

From the news items of one of our leading papers I clip the following: "Sixty thousand quarts of strawberries arrived at the Albany, N. Y., market June 23d from within a radius of ten miles of the city. The sales were from 3 to 6 cents per quart. The week previous they sold three quarts for a dime in Cincinnati, Ohio."

A correspondent of the *Country Gentleman* for July 23d, writing from northern Ohio, says: "Hundreds of bushels of strawberries have been retailed on our streets for four cents per quart, and the best of Cumberland and Sharpless often only brought six cents. After paying for picking the fruit, manuring the land, caring for, after being planted, interest on the land, and other expenses attending the taking care of the crop, there is not much of a margin left.

We often see writers advocating raising strawberries and other small fruits in the neighborhood of manufacturing towns, because of the large amounts of money to be made at it, with no danger of overdoing it as the demand is always greater than the supply." This condition of things rather forces him to the conclusion that the small fruit business can be overdone. It is rather difficult to come to any other conclusion, as the markets throughout the thickly populated portions of our country, seem, as far as I can learn, about in the same condition.

Is the grape market any better when Concords

retail at 4 and 5 cents a pound, with finer varieties from 6 to 10 cents, and abundant at that?

And this is not only so this year, but year after year.

Is it not evident and desirable when confronted with this condition of affairs, that some remedial measures are necessary before small fruit growing can justly claim to be a profitable business?

What those remedies are, and how best to apply them, I leave for your suggestion. I will, however, name one, and that is increased consumption.

We should endeavor to teach the great industrial classes of our cities, that a full and generous diet of fruits is healthful, economical, and profitable, that they can well afford an abundant daily supply during the season at even higher prices than generally rule, that their bodily health and all their mental and moral faculties, will be much benefitted by this course. The consumption in this one direction might be doubled, and still many families get hardly a taste.

I once, some years ago, visited by invitation a large small-fruit grower to inspect his large and profitable crop of fruit then in the height of its season. It was evening when I arrived, and I had to accept his hospitality for the night. On being called to breakfast next morning I expected as a matter of course to sample the table qualities of the fruit before repairing to the field. In this I was most egregeously disappointed. The chief dish at that morning meal I shall never forget,—it seemed so incongruous with his profession. It was "not Hog and Hominy," but salt mackerel! That man grew fruit to sell, and you may be sure if there was any money profit in the business he found it. He was a great champion of profit in fruit growing, and like others of his class had but this one string on his harp and played it for all it was worth.

Think of it, fruit by the acre—bushels of it going to market every day, a large and growing family around him, yet no fruit for the morning meal. What a travesty on the refining influences of horticulture! But there is another method of fruit growing for profit, and other sources of disposal of the crop, in markets from which the profits are certain and sure, with no competition to be feared, markets in which all the profits will accrue to the fruit grower and his family, markets in which fruit-growers of the class just mentioned can never make a success. These markets are co-extensive with our country, they are almost innumerable. Thousands doubtless are not half supplied; and there are other thousands with no supply at all. These markets are to be found at the family table in the household of every farmer in the land.

One of the first objects of these farmers should be to provide a full and abundant supply of small fruits for the wants and desires of his own family, of home growth. This is his duty. They will derive from it a pleasure he could not buy, and the profits accruing to his family, in increased health, and all its attendants, he could not possibly compute in dollars and cents. The land devoted to their production, and the labor spent in their cultivation would be the best and most profitable of the whole farm.

No one with land sufficient for this purpose under his control should depend on purchasing his family supply of these luxuries from the ordinary markets, for no family dependant on this source of supply ever had their wants filled as fully and satisfactorily as they would, were they at the door merely for the gathering.

Is this field of increased consumption worthy of your consideration and cultivation? I think it is.

The discussion was continued by F. M. Hexamer, of New York. He called attention to the great improvement made in the strawberry. But, said he, this improvement has been only in size; all efforts have been in that direction, and there has been a diminution in quality. We cannot expect improvements in all respects at the same time, and what we now need is an improvement in flavor, even if it be at the expense of size. The strawberry of the future will, I think, be of considerably less size, but of better quality, at least for home use; for shipping purposes firmness is of paramount importance, and quality of less importance. But I doubt if we shall ever have anything better than the Wilson for that purpose. A berry for shipping and keeping must have acidity. Medium sized berries sell best in the market.

I think in propagating strawberries we have not given sufficient attention to the individual character of the plants of the same variety. If we would observe in strawberries the same

methods that we do in vegetables, I believe we would improve our present varieties very much; and I believe that the so-called running out of varieties is due to the fact that we propagate from inferior stock. I believe that if we select the best plants and plant them in beds by themselves that we can improve them so much that they will look like different varieties. Then in the production of true varieties from seed propagators have learned much; they have learned to trust more in means; we can't expect to get size by combining two large varieties. To obtain any given improvement one of the varieties should have that feature as marked as possible, and the other should simply be a strong, well established variety, without any such special feature. Again, I think we have much to learn with regard to the use of special fertilizers in the improvement of varieties. We also need to learn the particular needs of special varieties. The same treatment will not answer for different varieties. Different types of varieties require different treatment. For example, the Great American. I cannot grow it; can hardly keep the plant alive, while a man not far from me grows it by the acre. He has them in wide matted rows, and has raised, I believe, the largest strawberry crop that ever grew. He has sold as high as $1,700 worth from an acre. We have to study our soils, the special climates and varieties.

A. W. Harrison, Pennsylvania: Is there anything by which we can judge of the quality of fruits by their appearance? Thirty years ago I grew sixty varieties of the strawberry, and the best among them was the Peabody, which had a very long, slender, and silky, tapering neck; like some of our wild sorts, and I never knew an inferior strawberry with that mark.

J. B. Rogers New Jersey: I believe that is a general characteristic of excellence.

F. M. Hexamer, New York: The Henderson is like the Peabody in that respect, and is as good, or a better berry.

G. G. Bennett, Michigan: I would like to have Parker Earle tell us what varieties he cultivates mostly, and why?

Parker Earle, Illinois: I succeed in growing the Crescent, and generally fail with nearly all others in producing profitable crops. I have used Wilson, Captain Jack, Champion, Downer's new Prolific, Sharpless, and others, to fertilize with, I think quite successfully, but we now use the Sharpless almost exclusively to fertilize the Crescent. I plant with reference to what I believe to be a decided effect of the fertilizing variety upon the fruit. I cultivate in matted rows.

N. J. Coleman, Missouri: Why do you use the Crescent and not the Wilson?

Parker Earle, Illinois: Because we can grow it.

C. A. Green, New York: I find good qualities in many different strawberries but have not settled on any one variety.

N. J. Coleman, Missouri: Soil makes a great difference with varieties, and I have found on a rich soil with clay subsoil that the Wilson is a very good berry. Near St. Louis the Crescent does not compare in market, shipping qualities, or productiveness with the Wilson.

Parker Earle: We think in Southern Illinois that we can grow very successfully about all the kinds that anybody grows. The rust, however, prevents the culture of the Wilson there, so we use the Crescent, which largely escapes it. Another difficulty, especially in the last four or five years, is the tarnish plant bug, which attacks the fruit. I would prefer other kinds to those which I raise, if I could produce them.

D. T. Fox, Michigan: I have planted the Manchester fertilized with Wilson, and have had twice the number of berries from the Manchester as the Wilson, and the former sold for 12½ cents while the latter brought but 10 cents.

Mr. Morrill, Michigan: At the mouth of the St. Joseph we often ship ten thousand bushels of an evening. We have all varieties, but I believe that the last two years' experience has pretty generally convinced our people that we have but two market varieties: Crescent for light soils and early, and Sharpless for heavy soils and a late market. We have too many Wilsons to suit the market, and it rusts badly. I have Sharpless, Crescent, Manchester, Vick, Wilson and Bidwell in rows in my garden, and the Wilson bears less than any other and the Crescent more than any other, and is the earliest. The Manchester is very good and very productive, but must be picked carefully or it will come off without the calyx. It is a fine family berry, but

turns too dark on exposure to the air, to sell well in market. Its form is even, its foliage rather tender. James Vick has very strong foliage, and is a strong grower. The berries are small until they begin to ripen, and then they increase in size rapidly. It is a promising shipping variety, of good color and sufficiently tart. These three varieties, Crescent, Manchester and Vick, are about the only ones that are all right. Extensive efforts are being made in that locality to introduce the Great American.

Samuel Hape, Georgia: The Sharpless is the best berry in my neighborhood, near Atlanta. If I were to select the three best varieties I should say Sharpless, Crescent and Wilson. The soil in my locality is well adapted to strawberry culture. We have none of the difficulties Mr. Earle has mentioned. Strawberries grow wild in profusion.

H. M. Engle, Pennsylvania: We grow a large proportion of Sharpless. The Crescent is very productive, but does not sell as well. The Crescent has great tenacity, and will endure neglect better than many others, but no berry will be more improved by proper management and care.

F. M. Hexamer: I would like to ask Dr. Hape about the Newland strawberry.

Samuel Hape: It lacks quality. Its principal merits are its earliness and good shipping quality.

Mr. Morrill: The Sharpless is very susceptible to cold in the blossom; it is much more tender than Crescent and Vick, and but must be kept back by mulch until the danger of frost is over. Mr. Morrill mentioned the great success with Sharpless about Barnesville, Ohio.

C. A. Uber, Virginia: The Sharpless does well with us.

D. W. Hinman, Michigan: I did not have success with Sharpless in New York, but it does well where I now am near the mouth of the Kalamazoo river. Had a Sharpless this year ten and a quarter inches in circumference weighing 3 oz. 15 dr

E. M. Hexamer: There was a strawberry exhibited at the New York Horticultural Society a few years ago, called the President Lincoln, which was fourteen inches in circumference, and three inches in diameter at its widest point.

John S. Collins, New Jersey: A berry known as May King has been grown two or three years in our part of the country, which is early and of good quality.

A. E. Gipson, Colorado: We grow the Sharpless very large, but we find that with us the berry is a poor shipper, and it is being discarded.

Mr. Morrill, Michigan: The Sharpless berries reach Chicago from Barnesville, Ohio, in good condition, about 400 miles by rail. I think your irrigation makes it a poor shipper.

Parker Earle: The shipping quality depends largely on the soil and manner of growth. As I grow and ship strawberries the Sharpless is a good shipper. I have no difficulty in shipping it 1,000 or 1,200 miles by rail, and the same is true with all the strawberries I grow. In some soils no strawberry will stand shipping. The weather also has much to do with their ability to stand shipping, yet they have been shipped successfully from Southern Mississippi to Chicago for many years.

At the close of the discussion on strawberries, an invitation was received from J. J. Toon, of Atlanta, Ga., for members of the society to attend the Georgia State Fair.

In continuing the discussion a paper was read upon

BLACKBERRIES.

By G. Cowing, Muncie, Indiana.

A rich and well-drained clay soil is most favorable to the blackberry. On such a soil, I have never known some of the more hardy sorts injured by the most intense cold, while I have seen them much injured or killed, on more sterile ground in the same patches. This does not accord with the belief of many who claim that a rich soil causes a rank growth, which is easily winter-killed. Cultivation late in autumn should be avoided and the plants be allowed to rest and mature their wood.

A deep and rich soil is necessary to the production of large and luscious fruit. To prevent the effects of drought, I regard a heavy mulch of leaves or straw, as better than cultivation. The best wild blackberries are always found near brush heaps or rotten logs.

In planting, the rows should be seven and one-half, or eight feet apart, with an occasional interval still wider, to allow a wagon to pass through with manure, or mulching material. Plants should be two feet apart in the row, and I have

found strong sucker plants to be quite as satisfactory as those from root cuttings. I recently pruned some rows of Taylor from sucker plants, transplanted sixteen months before, which were generally three and one-half feet high, three feet across the top, and which presented the dense and compact appearance of a well kept hedge. For pruning such a line of plants, a grass hook or sickle is best.

To save time and labor, it has often been my practice when planting blackberries, to plant strawberries in rows with them, and in rows midway between them. Some of my best strawberries, this season, were from plants set last year with blackberries.

All blackberry plants, when three feet high should have their terminal buds nipped, to force them to throw out lateral shoots. A severe nipping is often necessary to produce a compact and sturdy growth, capable of resisting strong wind.

Berries should not be picked until sweet, nor oftener than twice a week if intended for a home market, nor after being picked should they be exposed to a burning sun, as such exposure will change their color from black to red and give them a better flavor.

But few varieties of the blackberry worthy of general cultivation, have yet been tested. The Lawton, introduced about twenty nine years ago, was the first generally cultivated. Kittatinny followed it, and proved slightly hardier and of better flavor, but very liable to rust, and not sufficiently hardy to be reliable in the west. Snyder, Taylor, and Wallace, all originating in Indiana, and Stone, from Wisconsin, have since been introduced and found to be the only sorts that can be profitably planted, west of the Alleghanies, and north of the Ohio river. They are all remarkably productive, vigorous, free from disease, and of the most lucious flavor. Snyder is the first to ripen, and its earliness is a strong point in its favor; when grown on rich ground its berries are above medium size.

The berries of Taylor and Wallace are larger that those of Snyder, and are hardly equalled in their exquisite flavor by those of any other variety, and I can think of no reason why they should not prove profitable in the South.

The present season has been a most unfavorable one for the blackberry in central and eastern Indiana, and was caused by the intense cold of last winter, and drought and innumerable grasshoppers during the growing season. Stone is a hardy as Snyder, and its berries of about the same size and quality; it ripens later than Snyder; ripens with Wallace, and before Taylor.

It is somewhat remarkable, that while the great majority of our best strawberries have originated in the East, that region has never produced a hardy blackberry of especial value. I refer to well tested sorts only.

From the hardy and healthy sorts, I have named, we may reasonably expect seedlings that will prove still more desirable.

Western Triumph is often commended for its hardiness, but I have found it tender, and disposed to rust. Its foliage and fruit indicate a close relationship to Kittatinny.

W. F. Bird, Michigan: I would like to ask how Stone's Hardy, compares with Snyder in Michigan?

T. T. Lyon, Michigan: I have grown Stone's Hardy for several years. It is generally too small. It is nearly as hardy as Snyder, very prolific and of good quality. It is too small, however, for a successful market variety.

Mr. Johnston, New York: I have cultivated it three or four years, and it is perfectly hardy with me; is fully as good a bearer as Snyder, and a better berry. I believe all our hardy blackberries are small. It continues in fruit longer than any other variety.

J. C. Plumb, Wisconsin: Stone's Hardy originated in Wisconsin. It does well with poor care. The matter of hardiness is of little importance, as any blackberry will do enough better for laying down to pay for the trouble. Stone's Hardy cover the fruit well with the foliage; in this it differs from the Snyder.

Chas. A. Green, New York: It is fully as good as the Snyder and other hardy sorts.

J. S. Woodward, New York: I would like to enquire about the Evergreen blackberry.

Chas. A. Green: The fruit of this is small and of no value. Its leaves remain through the winter. It is the same as that which has long been known as the Cut Leaf.

T. T. Lyon: I would like to hear something of the Early Harvest.

Mr. Morrill, Michigan: I had 500 plants of this the past winter, but laid them all down but 50 plants. These killed to the snow line and

gave but half a crop. It yields well and matures its last picking with the first picking of the Wilson. The berry is small and looks like the wild berry. It does not look small, however, because it is so uniform. It is a good shipper, and does not redden in standing, as some kinds do; for example, Lawton and Snyder. It looks as though it were varnished.

E. H. Scott, Michigan: It kills to the ground with me.

Jacob Ganzhorn, Michigan: It is a good grower, but killed to the ground with me last winter at—20°.

T. V. Munson, Texas: The Brunton and Early Harvest belong especially to the South. The former is worthless except when fertilized by Wilson or some other sort. With the Early Harvest near it, becomes immensely productive. They ripen together, and are marketed together, and cannot be distinguished. The Brunton is the best shipper we have, and is the hardiest; *i. e.*, in ability to withstand rust and drought. The Early Harvest is good if it has plenty of moisture.

C. M. Hobbs, Indiana: The Early Harvest killed the two past winters with us. We are fruiting the Lucretia Dewberry, which is very productive, of large size and beautiful color, but poor in quality.

Mr. Johnston, Illinois: We have the Brunton, Early Harvest, Wilson, Jr., and Early Cluster, which all killed the past winter. The Western Triumph has never been winter killed, and bears good berries of excellent quality. We get more pleasure, however, from the Agawam, which is perfectly hardy, a good bearer, and as beautiful as the Snyder or Kittatinny, while its flavor is better than that of any of the other named.

Geo. W. Campbell, Ohio: Has any one else grown Hobbs' Everbearing Dewberry? It originated in Miami County, Ohio. I have found it all that could be wished. It is a prolific bearer, of large size, handsome, too acid until quite ripe, but when fully ripe of the very best quality.

Joseph Lannin, Michigan: Will some one describe Taylor's Prolific.

E. H. Scott, Michigan: I have fruited it six years. It bears fully three-fourths as much as Snyder, is about a week later, of better quality, and does not turn red on standing like the Snyder. My soil is clay.

J. C. Ratliff, Indiana: I have attempted to fruit it for several years, but it doesn't bear with me.

C. A. Green: Chas. Downing considers it one of the best, the largest of the hardy berries that he has.

W. Phillips, Michigan: It does well with me and is bearing a full crop this year, though the temperature fell last year to—26°. The Early Harvest has killed to the ground the past three years.

C. M. Hobbs, Indiana: Taylor's Prolific originated near Spiceland, Indiana. In some localities it has given very good satisfaction. It is not as hardy as Snyder, but is reasonably productive, of larger size and better quality.

T. T. Lyon, Michigan: There seems to be no difference in hardiness at my place, South Haven, between them, and the Taylor is nearly as productive as the Snyder. The Dewberry is as tender as the tenderest blackberry, and would winter-kill were it not for being so close to the ground. The berries get sandy, however, unless the vines are raised from the ground in some manner. The Lucretia is a poor shipper.

Mr. Morrill: Taylor's Prolific has a pale green cane unlike any other kind. With me it out-yields Snyder. It is larger, holds its color better, and is a better grower if anything. It throws up its canes early, so that they are troublesome to the pickers. I have the Ratcliff, which I obtained from Mr. Taylor himself. It is too strong a grower for fruiting the best.

W. W. Hilborn, Ontario: I have tried to grow Taylor's Prolific six years, and never succeeded in getting any fruit. It is not as hardy as Kittatinny.

A. E. Gipson, Colorado: The question of hardiness is of no importance to us, as we cover all. We do not look for a variety that will stand our winters. We use a plow in covering.

J. C. Plumb, Wisconsin: The Ancient Briton has been very successful at Ripon, Wisconsin.

RASPBERRIES.

J. C. Plumb, Wisconsin: I would like to ask if the Caroline is hardy. It is said to be hardy in Dakota, but insipid.

Chas. A. Green, New York: We prize it for the table.

Mr. Redding: It is a good substitute for Brinkle's Orange.

T. T. LYON: It drops its foliage sometimes, which causes the latter part of the crop to be poor. It has little tendency to make suckers. The fruit is soft.

J. B. ROGERS, New Jersey: The foliage remains on with us, but it is too soft.

MR. JOHNSON, Indiana: It is fine for the table.

B. G. SMITH, Massachusetts: It does well with me.

T. S. HUBBARD, New York: The Caroline does well with us, but is of poor quality.

G. G. BENNETT, Michigan: Is there any difference between the Tyler and Souhegan raspberries?

T. T. LYON: A difference in origin, but not in other respects.

MR. REDDING: The Souhegan originated in Mt. Vernon, New Hampshire, before the Tyler. The Tyler originated at Auburn, New York, with Nathan Tyler.

MR. JOHNSTON, New York: How is Shaffer liked?

E. H. SCOTT, Michigan: It bears more than any other variety. Its color is too dark for the Detroit market. It is the very best for canning.

P. M. AUGUR, Connecticut: It does well with us—is a strong grower, good bearer of large fruit, which sells at a good price.

J. GANZHORN, Michigan: It is productive, a large berry, fine for canning.

C. M. HOBBS, Indiana: One of the strongest growers and most productive raspberries we have, and among the largest in size. It has a sprightly, pleasant acid flavor, and is one of the best for cooking.

B. HATHAWAY, Michigan: More hardy than most other raspberries—hardier than Gregg, Cuthbert or Souhegan.

SAMUEL HAPE, Georgia: It succeeds admirably with me.

T. V. MUNSON, Texas: Raspberries are all a failure in Texas.

C. A. UBER, Virginia: The Shaffer is fine with us, but not as good as Herstine.

W. C. STRONG, Massachusetts: Shaffer does well in Massachusetts.

MR. JOHNSTON, New York: I believe we have no variety of fruit that is worth so much. It is especially fine for evaporation. I never saw but one person who complained of its flavor. Still it has not a high flavor.

G. G. BENNETT, Michigan: Its color is against it. It is too soft to ship. Its color is better if it is picked early. It is hardy here, of the largest size, and one of the best berries. For canning it is the best, still it does not sell well, though Mr. Garfield succeeds better with it than the rest of us in the Grand Rapids market.

E. M. HEXAMER: I believe that if people could eat it with their eyes shut, it would be a profitable berry; but it don't sell; in large cities they will not have it. It does very well to talk about educating the people's taste, but it is not profitable.

L. R. JAYNE, Ohio: It sells in Cleveland when once introduced.

GEO. S. STREATOR, Ohio: It is the best for our village market.

J. S. COLLINS, New Jersey: It is of no value for New Jersey.

N. OHMER, Ohio: Though excellent for cooking, it brings the lowest price in the Dayton market. In the long run, however, it probably pays on account of its size and quantity. It is hardy.

T. V. MUNSON: I would like to hear how the Marlboro withstands drought?

SAMUEL HAPE, Georgia: I have tried it one year and it has stood the sun very well.

J. S. COLLINS, New Jersey: It is a fine, large, showy, beautiful red berry which ripens early, but unevenly and is of poor quality.

P. M. AUGUR, Connecticut: It is early and productive, but the quality is not of the best.

C. A. GREEN. I see no reason why it should not become popular though it is not of high quality.

C. M. HOBBS: It is vigorous, hardy, productive, of good size, firm enough to handle, of fair quality—equal to Hansell.

A. E. GIPSON, Colorado: I am much pleased with it. It is valuable for market—large size, good form, fair quality, good color.

MR. MORRILL: I would like to hear about the Rancocas. It is said to ripen its crop within ten days.

J. S. WOODWARD: It is early and very good.

J. S. COLLINS, New Jersey: I have seen it in fruit three or four years, and I think it ripens faster than Hansell.

H. M. ENGLE, Pennsylvania: I think it will become a valuable berry.

F. M. Hexamer: The customs at the commission houses in New York mostly prefer Marlboro.

T. T. Lyon: I received a new Black Cap from Ohio which came from W. W. Hilborn, Ontario, which I esteem to be one of the finest in flavor, and one of the largest in size.

W. W. Hilborn: I have fruited it seven years. It is the most profitable berry that I have grown. It is hardy and a little later than Souhegan, of the best quality and gives the largest crop of anything I have.

N. J. Colman, Missouri: The Parnell stood the past winter in our section and gave a large crop. It is a fine red raspberry and is considered the hardiest of any at St. Louis.

C. M. Hobbs, Indiana: I would like to hear about the Crimson Beauty. With me it is a strong grower, hardy, productive, of good size, beautiful color, fair quality, rather better than Hansell or Marlboro. It parts too readily from the receptacle and hence falls easily.

T. T. Lyon: I have had it two years. The first year I found it very much as Mr. Hobbs has said. This year there are many imperfect berries.

H. M. Engle, Pennsylvania: I have found it about the same. There are a good many imperfect berries, and it is not as prolific as some others I have. It is of good quality.

C. A. Green, New York: I obtained the plants from the originator three or four years ago.

E. H. Scott, Michigan: I obtained my plants from Mr. Purdy; have not had a perfect berry.

J. B. Moore, Massachusetts: I obtained from President Wilder some plants of the Shucha. It is handsome and productive, but too tender for market.

CURRANTS.

Mr. Johnson, Indiana: I would like to ask about Fay's Prolific.

B. G. Smith, Massachusetts: It is not as good nor as prolific on my grounds as Versaillaise.

J. B. Rogers, New Jersey: One of the best, and very promising.

W. W. Hilborn, Ontario: It is all that has been claimed for it.

E. H. Scott, Michigan: I can say the same. A number of others were of the same opinion.

T. T. Lyon: A peculiar difficulty with us is the borer. The Victoria is exempt.

GRAPES.

This subject was opened by a paper from Geo. W. Campbell, of Ohio.

AMERICAN GRAPES.

As I have been chosen to say something upon American grapes, at this meeting, I will remark principally upon the efforts which have been made towards their improvement, and upon what we may reasonably expect in that line, in the future. Comparing the present with the past, we have much to encourage us. Whoever can look backward for forty years, can remember when the Catawba, the Isabella, and the Clinton were about the only grapes in cultivation in this part of the country; and when the Delaware, the Concord, and the long list that have followed them, were unknown. Mr. Downing's latest edition of the Fruits of America catalogues about 160 named sorts; but there are probably now more than three hundred distinct varieties, and still, they come! The largest collection of native grapes ever made in this country, was brought together at the first meeting of the Mississippi Valley Horticultural Society in 1880, at St. Louis, where 249 distinct varieties were exhibited. Although the number of varieties has been so greatly increased, I regret to say, improvement in character and quality has not kept pace with their increased numbers; and although we now have grapes in such great variety, and probably those suited to all sections where the grape can be successfully grown, the standard of excellence in quality has not been greatly advanced in the grapes in general cultivation, since the introduction of the Delaware.

The three great obstacles in the way of improvement of our American grapes, are mildew of the foliage, rotting of the fruit, and tenderness of the vine in severe winters. That all these difficulties will be overcome in any one variety bearing fruit of fine quality, may be doubted; but approximations may be reached in different varieties, suited to the various grape-growing sections of our country.

We who have been long striving towards the improvement of American grapes know just what one want! A vine vigorous in growth and productive, with foliage resisting attacks of mil-

dew in all places and in all seasons—enduring also uninjured, a temperature of 40° below zero in winter, and 100° above in summer. Then, if a black grape, it should be as large, and as good, as the Black, or the Muscat Hamburgh; if red, as good and as large as the Grizzly Frontignan; and if white, the Muscat Hamburgh would do for a prototype. It is probably too much to expect to attain all this; but it is not too much to either strive, or hope for; and that these grand results may be approximately reached, through careful and judicious crossing and hybridizing, I have little doubt.

The Delaware grape has great hardiness in winter; great productiveness; fine quality, and remarkable exemption from rot. Its weak point is in its sensitive and delicate foliage, subject to mildew in many localities, and in variable and unfavorable seasons. I have found that crossing the Delaware upon the Labruscas, such as the Concord and Worden produces vines with healthy, mildew-resisting foliage, and with canes that endured, uninjured 32° below zero last winter; and when Concord, Moore's Early, and other Labruscus were killed to the ground, with wood brown, clear through. Some of the crosses above-named, which have fruited, approach, but do not equal the Delaware in quality.

The experiments of Mr. Ricketts, Rogers, and others have demonstrated that it is practicable to produce grapes by hybridizing our natives with the *vinifera* or foreign varieties, having very nearly the excellence of the finer foreign kinds; and this too by the first crossing. All these retain too much of the foreign element to be generally successful; as the foliage mildews in many places, and the vines cannot endure our severe writers unprotected. But they are both hardier, and healthier than the pure Vinifera; and are thus one step towards the improvement we seek. The Brighton grape is understood to be a second crossing, and three-fourths native, and has been found to succeed well in many places; apparently as healthy and as hardy as the native Catawba.

Several of Mr. Rogers' Hybrids have become standard varieties, and succeed better in many places than some of our pure native seedlings. One of Mr. Ricketts' later productions, the Empire State, though claimed to have been produced by crossing the Hartford with Clinton, appears to have some foreign characteristics in its fruit, and probably through a Clinton Hybrid. But whatever may be its parentage, I am satisfied, after growing it for three years, subjected to the severest tests, that it is nearly, if not quite, as healthy in foliage and as hardy in winter as either Hartford or Concord. Though I have not fruited it sufficiently to say much from personal experience, I have seen it often on exhibition, and admired its fine appearance and good quality. It is also remarkable as a long-keeper, and seems to me to be a second and very important step in advance in the way of improvement.

The Jefferson grape, said to be a cross between Concord and Iona, is another fine grape with healthy foliage. Unfortunately it is not quite hardy in our severe winters, but will doubtless prove a valuable acquisition in milder latitudes, or where growers will give winter protection. All these varieties, besides being valuable in themselves, may be even more so, as parents of other varieties, in still further improving, the grapes of the future.

The Niagara, too, though it does not seem to realize the high expectations at one time entertained, being in many places neither quite healthy in foliage, hardy in winter, nor exempt from rot, may prove valuable as a parent of something better, as a seedling from it was exhibited at a meeting of the Ohio State horticultural society last week, which all present who had tested the Niagara pronounced better in quality than the Niagara itself.

Improvement by means of cross-breeding or hybridizing is necessarily slow and tedious, but it is measurably certain in its results, and infinitely more rapid than trusting to chance, or the planting of promiscuous seeds, however selected. Planting seeds from varieties growing near each other may possibly produce some natural crosses between them, but the probabilities are all against it. While careful removal of the anthers from one variety before the pollen cells have burst, and supplying the fertilizing pollen from the other with which it is to be crossed, under proper conditions nearly always produces a definite result. I have thus produced the Muscat flavor in seedlings of the first cross between Muscat Hamburgh and Hartfords, and Concords as pronounced as in the Hamburgh itself. Seedlings not artificially fertilized have been in my experience much

more variable, and more disposed to degenerate towards the wild, original species. Delaware seedlings usually go back to the wild form, having small, black grapes, sour and acrid, with large seeds; and of the many Delaware unfertilized seedlings that I have raised have never had one really worth perpetuating.

I have long experimented by crossing some of the finer foreign varieties upon our hardiest natives, in the hope of producing a grape with the native habit of vine and foliage and the quality of the foreign: and though I have produced many that approached this desired result, none have quite reached it. In future experiments I shall only use these hybrids in crossing the healthiest and hardiest native varieties, and shall at the same time continue to cross the best and hardiest natives.

Besides the seedling crosses between the Delaware and the Labruscas, I have found the Rupestris grape-vines perfectly hardy, and perfectly healthy. The most unfavorable seasons have no injurious effect upon their foliage, and they seem to rejoice in 32° below zero, not a bud being hurt. This season one of them bore a characteristic crop of its small, black clusters, ripe middle of August; pleasant flavored, and less acid than most of our wild grapes. I have crossed it with Muscat Hamburgh, and several of our best varieties, native and hybrid, and shall look for some interesting and perhaps valuable results. The past three winters have been so severe, and the destruction of vines has been so great in many places, it is apparent that hardiness, or ability to resist extreme cold, must become one of the most important requirements in all grapes for general culture. I have been convinced for some years that, taking one year with another, no work done in the vineyard would yield a larger return than that of pruning the vines as early as possible in autumn after the leaves have fallen, and then laying the vines upon the ground. Where there is sufficient snow in winter to cover them during the coldest weather, this affords perfect protection, and the yield will be greatly increased. Where there is extreme cold without snow, a slight covering of earth will suffice. But simply laying the vines upon the ground, with no covering, affords considerable protection, and I have often noticed that canes that had fallen down and laid upon the ground during very severe winters, would remain uninjured, and bear finally, while all upon the same vine which were left upon trellis were killed. I regret greatly that the cold and backward season has so retarded the ripening of my grapes that none are in good condition for exhibition. A few will be found upon the tables that may have some interest for grape-growers. A list of a few of the crosses which I have made, and many of which are in bearing, will show the direction of my recent experiments. The first-named is the pistillate or seed-bearing variety:

Delaware, crossed with Concord, Catawba, Worden, Brighton, and Norton.

Belvidere, with Muscat Hamburgh, and Grizzly Frontignan; some of these are on exhibition.

Concord, with Delaware, Muscat Hamburgh, Chasselas Musque, and others.

Lady, with Lady Washington, Grizzly Frontignan.

Elvira, with Delaware, Juno, Muscat Hamburgh, Chasselas Musque, and others.

Worden, with Delaware, and Purity.

Janesville, with West's St. Peters.

Vergennes, with Rupestris and several hybrids.

Brighton, with Delaware.

Rupestris, with Delaware, Brighton, Pocklington, Muscat Hamburgh, and several hybrids.

Seedlings from various kinds, Far West, Niagara, Poughkeepsie Red, several hybrids, Empire State, and various others.

Hardiness, healthy foliage, and good quality are what should now be sought by all growers of new grapes; and it appears to me not unreasonable to expect this combination from some of the above crosses. Vigor of growth, productiveness, and fine quality have been attained: but so far, it must be confessed, the highest quality is accompanied by a degree of delicacy also of foliage, and tenderness in severe winters. If this can be overcome—and I believe it can, in time—we have already the fine quality, and need only the healthy foliage and hardy vine to rival any grapes in the world. The tendency now is, in nearly all fruits, to offer too many new varieties, and to introduce them to public notice with praise far above their merits. Some allowance may be made for the enthusiasm of the grower of a new seedling, who may not be aware that there are already many older varieties which are

better; but as one by one the many high-priced, and highly extolled novelties of previous years are dropped from the lists, the principle becomes more apparent, that no new fruit is worthy of introduction that is not in some respect, or for some locality, better than those we have already. These remarks bring to mind a box of grapes which I received a short time since, accompanied by a newspaper slip purporting to give a description of this so-called new variety. Its terms are so extravagant, I shall preserve it as a curiosity in its way, and will read it, for the benefit of those who may not have heard of this new wonder, which is named the "Lutie."

"This grape of native origin, raised on the farm of Dr. L. C. Chisholm. It is supposed to be a seedling derived from a cross between Moore's Early and another seedling. The vine is a hardy, robust grower, excelling Moore's Early, Concord or Ives. The leaves have never been known to mildew, even in the wettest seasons. Mr. H. R. Coleman has a plant one and a half years old on his farm with canes as large as a man's finger, and seven to nine feet long, with leaves eight and a half inches across the base. It is the earliest and most abundant bearer in existence, vines from cuttings eight months old having been known to produce well-developed berries, and from a vine three-years-old 39½ pounds of luscious fruit was plucked. It is of a light chocolate color, bunch lightly shouldered, very compact and firm, stem adhering strongly to the vine. The flavor of this grape far excelled the well-known Delaware and is equal to the Hamburg or Muscat, the celebrated greenhouse grapes of the old word, and a perfectly green Lutie is sweeter than a dead-ripe Concord or Ives. The berry is a little larger than the Concord bunch medium, many bunches weighing as much as 1¼ pounds, and the general average is three quarters of a pound. It is the earliest grape in cultivation, ripened July 15th, 1882.

In Dr. Chisholm's vineyard of over one hundred varieties such as Prentiss, Norton, Concord, Lady, Ives, Pocklington and Moore's Early, the most popular southern grapes in cultivation, we noticed that over half, and sometimes the whole bunch, of these varieties had rotted, while it was impossible to find a single rotten berry among the Luties. During the hard winter of 1882–3, when the thermometer registered away below zero, the Lutie stood the test, being perfectly sound and green to the smallest tip end, while the Delaware and Perkins were killed to the ground, and Concord and Ives injured. Mr. Crosby, a man of great experience in grape culture, both in this State, and in California, says that it excels any grape he has ever seen either in California or elsewhere. Those who are interested in wine-making say that it will make a superior sparkling white champagne, with a boquet equaled by none of foreign make. Taking it altogether, with its ability to withstand successfully extreme cold and hot, wet or dry weather, with its delightful fragrance, beautiful color, compact bunch, great productiveness, and indescribable but delicious flavor, with its adaptability for all the purposes to which a grape can be put, either as a market, table, shipping or wine-making grape, it stands far above anything in the grape line; and the State of Tennessee, and especially Davidson county, ought to be proud of having the chance of introducing to the public something so well worthy of public notice. Messrs. H. R. Coleman, A. W. Webber and A. W. Newson own the exclusive right of propagation and whole interest in this most excellent grape."

Our honored President Wilder wrote me he had also received a box of "Luties," but they were in such horrid condition they had to be sent out of the house. The condition of those which I received, was good enough, but their "indescribable" fragrance was such that they had also to be sent out. They were simply fox-grapes, of the most odorous character, with the slippery pulp and pungent, sweetish, acrid flavor peculiar to that class; not as good as Venango, Northern Muscadine, Dracut Amber, or Perkins. To compare this "Lutie" with the Delaware and the foreign Muscats, would be like comparing the Kieffer pear with the Seckel and Flemish Beauty; or the wildest crab with the American Golden Russet apple. Not less extravagant was the reported weight of this wonderful "Lutie." One of the largest clusters, upon the scales, just turned three ounces, instead of the pound and a quarter, or average three-quarters of a pound. Since I came here, I find that specimens of this grape have been sent to other parties, some of whom are present;

and if any who have received it have been more favorably impressed, or have formed a better opinion of it, I shall be glad to have an expression from all such before this society.

Several members of the society who had received specimens of the Lutie grape agreed with Mr. Campbell as to its character, finding a common fox-grape of no value as compared with our best cultivated varieties.

THURSDAY—EVENING SESSION.

C. J. Monroe, of Michigan, in the chair.

Before the regular lecture of the evening, a half hour was given to a continuation of the discussion on grapes.

W. F. Bird, Michigan: I would like to inquire about the Brighton.

J. B. Rogers, New Jersey: One of the best early grapes, especially in some places. It mildews some, but is considered one of the best early grapes of the color.

H. L. Lyman, Virginia: We think it promising. It ripens well, ships well, is very early, and makes excellent wine. It possesses the double advantage of being an excellent table grape and a good wine grape.

P. M. Augur, Connecticut: It is not as hardy as Concord, but still is one of our best red grapes.

E. Moody, New York: It usually mildews. It is excellent but for that. It originated near my place.

J. J. Harrison, Ohio: It killed a little last winter with us, and mildewed a little this year.

H. M. Engle, Pennsylvania: This variety last year did not ripen with me. The year before it ripened perfectly. It does well this year: we would not dispense with it.

C. A. Green, New York: It originated at Rochester, and was introduced by Mr. Hooker. He never recommended it for a market grape, but it has exceeded his expectations even for that purpose.

W. C. Strong, Massachusetts: It is one of our best grapes, though somewhat subject to mildew. I would like to inquire about the Early Victor.

J. B. Rogers, New Jersey: It is one of the most promising I have—one of the best early grapes as to flavor; a great ways ahead of Concord.

H. L. Lyman, Virginia: It is also promising in Virginia; a fine grower.

H. M. Engle, Pennsylvania: How about the Worden?

H. L. Lyman, Virginia: I have had the Worden several years. It is a little earlier than Concord, perhaps two or three days. The bunches are longer, the berry larger and sweeter. It rots less and is as productive.

P. M. Augur, Connecticut: In Connecticut we think the Worden a valuable grape.

The lecture of the evening was then given on

ECONOMIC ENTOMOLOGY.

By A. J. Cook, Agricultural College, Mich.

Mr. President and Gentlemen of the American Pomological Society:

Ladies and Gentlemen:—I deem myself especially felicitous to-night in that I meet with those whose work in life, and whose thought and councils here are to bless mankind. He who makes two apples replace one, each of which is larger, more beautiful, more luscious than the one it replaces, he is most worthy to be knighted most worthy saintship. Yet this is the work par excellence of this Society. It is an honor to be associated, even in a humble way, with such persons engaged in so grand and so worthy an enterprise. God blessed Abou Ben Adam because Abou loved and blessed his fellow men. It is also a great pleasure to be called upon to present a subject in which, from long study and attention, I have become thoroughly interested. The study of nature is always grand and impressive, and ever yields the most delightful fruit. When such study aims successfully to mellow

the soil, and mow down the weeds that cumber the acres of the world's noble toilers, it is doubly delightful. Thus it affords me very great pleasure to present the subject of "Economic Entomology" to the members of the American Pomological Society. I could not have pleased myself better had I selected my own theme.

It would seem hardly necessary to remark upon the serious, wide-spread and persistent ravages of insect pests to persons engaged, as are those present, in growing and caring for the very food plants of these ubiquitous foes. Only last year the gardens of the Bay City, Michigan, horticulturists were totally devastated by the "Black Army Worm" (*Agrotis tennicu*), and only the summer previous the attention of all our horticulturists was turned toward the strawberry fields of the strawberry king, not in expectancy as had been their wont, but in sympathy and sorrow, as they learned that the queen of fruits was being sacrificed to the rapacious greed of the tarnish-plant bug (*Lygus lineolaris*). Yet notwithstanding these frequent and startling reminders, I am free to say that the half is not known. The very nature of the problem makes this supposition not only reasonable, but entirely probable. The major part of these injurious insects either work at night, when darkness masks their evil work, or else hide beneath the soil, and are thus screened from detection. Others still tunnel herb and tree, and while the trained eyes of the gardener notes the blight, he is all unprepared to even guess the cause, as it lies beyond his sight. How often have orchardists cursed our nurserymen for selling them diseased and feeble trees when their own lack of knowledge and care had permitted the borers to girdle and detroy. For years our apple-growers condemned the birds—their truest friends, which they ruthlessly sacrificed with rifle and musket—all forsooth because the buds were eaten from their fruit trees. Investigation showed that the birds were wholly innocent, and those night maranders—the climbing cut worms—were the real enemies. This very year three separate kinds of insects have been laying waste the corn fields of Michigan and other States. One cut off the stalk, one tunneled it from top to bottom, a third preyed upon the seed kernel. Yet many a person thought one enemy did all the harm. These are but illustrations of a fact that, much as have our horticulturists learned of the terrible and wide spread ravages of these insect foes, yet even now they have hardly reached the preface of this great volume.

Prof. J. A. Lintner observes that insects always impose a heavy tax upon the products of man's labor, and often manifest a desire to wrest from him the entire results of a season's toil, and he might have added that not infrequently they realize their desire most fully. It has been estimated by our most capable students as the result of very careful observation that each species of plant serves at least six species of insects as food. Our cultivated plants are not only more toothsome to us than the wild species from which they originated, but they are quite as highly appreciated by the phytophagous insects. How rapidly has economic entomology progressed during the past twelve years. Yet even twelve years ago, Dr. Packard wrote the following: "I could enumerate upwards of fifty species of insects that prey upon our cerials and grasses, and as many which infest our field crops. Some thirty well-known species ravage our garden vegetables. There are nearly fifty species which attack the grape vine, and their number is rapidly increasing. About seventy-five species make their annual onset upon the apple tree, and nearly as many may be found on plum, pear, peach, and cherry. Among our shade trees, over fifty species infest the oak; twenty-five, the elm; seventy-five, the walnut, and over one hundred species prey upon the pine." To show how subsequent knowledge has swollen these figures, let me state that Prof. Lintner gives the names of 176 species that are now known to attack the apple, while I have discovered three species this very summer, that are not mentioned in Prof. Lintner's list. What a graphic portrayal these figures give of the ravages of this host of destroyers that are ever waging war day and night, summer and winter, concealed, and in open daylight, upon the success and prosperity of the farmer and horticulturist. We all know how the Phylloxera have exterpated the vineyards and ruined the wine and grape-growing interests of many parts of France, and other European countries. Is it not significant that the French government appropriated the past year $200,000 for experiments in economic entomology, in the hope to drive out the formidable pest? The Hessian

fly often lays tribute to $20,000,000 worth of wheat in one year in a single State. Careful estimate has shown that the Rocky Mountain locust has effected a loss in Missouri, Kansas, Iowa and Nebraska in a single year of more than $100,000,000. Single counties in Missouri have suffered to the extent of $2,000,000. The chinch bug has destroyed $75,000,000 worth of corn in a single season in Illinois. The cotton worm of the South snatches millions of dollars each year from the Southern planters. From government estimates, based on census reports, the annual loss to our country, consequent upon insect depredations is more than $2,000,000. Yet as has already been explained, the unrecognized damage probably equals if it does not far exceed the known loss. Thus we see that this problem is one of great political and economic importance, and one worthy the consideration of our best statesmen. And the fact that we have legislators even who sneer at the word bug, and at the study of bugs, and research in this matter of insect despoliation shows that we have weeds in our legislative halls, as well as in our own gardens. The latter are plants out of place, the former, men out of place.

It is a grave matter, that these millions of enemies which are daily and hourly executing their onslaughts upon grove and vineyard, field and garden are not a transient foe. They show no desire to call an armistice; indeed they are swelling their ranks year by year. This is perhaps the most discouraging feature of this whole insect question. The wheat midge, a generation ago laid waste to the wheat fields. While we learn this very year that the wheat growers of Nova Scotia have abandoned wheat raising because of this self-same fly. We all know that the Colorado potato beetle and Codling moth, indeed the whole host of injurious insects show no lessened vigor, but are as rapacious to-day as ever before.

As already stated and demonstrated, these injurious insects are rapidly multiplying year by year.

Who cannot remember when our cabbage plants were almost free from disturbance. This year the cabbage maggot, *Anthomyia brassicæ* has blighted the plants widely throughout our country. While the imported cabbage caterpiller is dreaded in all our Atlantic and Mississippi States. Two years ago, I first called attention to the injurious work of *Anthonomus musculus* in our strawberry plantations; last year it made an attack at Staten Island, in New York, and this year it is even more widely distributed. Last year I discovered the "Black Army Worm," hitherto a rare moth, as the author of great and wide spread destruction in the gardens of our State. Later reports showed it to be a serious pest in Ontario, Quebec, and Maine. Last year the apple maggot *Trypeta pomonella*, long a pest in Eastern States, first attracted attention in Michigan by its many and filthy tunnels in our fairest autumn apples. The year before it first attracted attention in our sister State of Wisconsin. Last year a common insect, *Otiorhynchus ligneus*, was first discovered at our Agricultural College to be a serious enemy of the strawberry. Thus we might multiply examples indefinitely of the rapid increase of these insect foes. If we may judge from the past, this rapid increase, and this attack year by year from species wholly unknown before, or only known as innoxious species, will continue, and with greater increment, as the country becomes more developed. Cosmopolites like the Codling Moth and the Cabbage Butterfly will devastate wide regions, while each locality and State will have its own peculiar forms, which will annoy and devastate with no less energy in that their field of operations is the more confined.

While some of the reasons of this increase and spread of noxious insects are doubtless obscure and not yet understood, we can in part account for this rapid and steady increase of injurious insects among us.

We are constantly receiving immigrants from other parts of the world. The introduction of Cabbage butterfly *Pieris rapæ* from Europe into the Province of Quebec is well known and the exact date has been determined. The transit of that species across our continent has been watched with care and interest, till now it is devastating cabbage fields in the far west. Our Currant Sawfly *Nematus ventricosus* is another of these insect pests that came to us from over the sea. When I state that the Codling Moth, Wheat Midge, Grain Weevil, etc., are among these imported species, I need say no more to impress the importance of this part of my subject.

Within the past few years we have seen two imported insects attack our clover, each threatening great damage. California is just suffering from the Hessian fly, for the first time. Thus we see that this subject loses none of its importance. Each year may give us some new importation, some new enemy that may like the Currant Saw-fly, and Cabbage Butterfly, threaten with entire ruin some of our most valuable cultivated plants.

It is a well known fact which was first discovered by Darwin, that introduced species of all animals are more prosperous and vigorous than are closely related native species.

We have many illustrations of this among our insect enemies. Our imported Cabbage Butterfly comes as a terror among us, while the native *Pieris oleracea* is scarcely noticed and not at all feared. We also have a native American Currant Saw-fly, which no one dreads, yet its near congener from over the seas, makes eternal vigilance, and as constant warfare the price of currants. This is not strange, for in the great process of evolution each species grows into being hampered and controlled by its environment. The restraints of association and relations are ever felt, and ever tie as with thongs each species of plant and animal. Removed from its native heath, and these restraints which have grown into existence, and have been nourished side by side with it, are thrown off, and the species relieved of the many restraining influences that once held it down, pushes on with new life and vigor. Our imported insect pests are free from bird and insect enemies, and so have little or nothing to hinder their success and progress until in the lapse of long years, new conditions are evolved, which embrace these now acclimated organisms, and fence in their progress with the natural restraints and obstacles, which are walled about all nature's children, even from the monad up to man himself.

Another and perhaps even more powerful influence aiding to bring in upon us each year new and more formidable insect pests, is the constant and very rapid destruction of our native plants and trees. All of us have observed that insects are not without their likes and dislikes; very many, indeed by far the most, of our plant eating insects have some species of plant which appears to be especially toothsome to them. Yet, he is not a very close observer who has not noticed a growing tendency in the insects of any special locality to widen their range of food plants. We know that civilization in the human race is marked with a more ample and varied table regimen. May not the same be true of insects? Do you not remember that when the potato beetle from Colorado first made its advent among us, it dined exclusively on the green herbage of the potato plants? Soon it added egg plants, then night-shade, then tomato foliage, until now nearly a score of our plants and weeds contribute to its larder. I have noticed the same to be true with many of our insects. Some of our moths that once seemed to be confined to the foliage of a single tree now feed on a dozen. These plastic tastes and appetites indicate adaptability which may serve the insects very materially. Our appetites, if normal, simply voice our needs. Hence, change of appetite means practically change of needs, or enlarged susceptibilities. It is, indeed, a great advantage to the insect, that these new adaptations and tastes are evolved in its progress, especially as in the rapid destruction of our native plants. Many insects would surely fall and perish with their accustomed food plants, except that new tastes and habits adapt them to the changed conditions. Thus reason, no less than observation, shows us that we must expect and look for new attacks, year by year, from insects whose native food having been destroyed have become enabled to relish and even thrive on new food—very likely better than on their old regimen. Thus the lent caterpillars flourish just as well on our cultivated apple as on the native wild cherry, though even now the wild cherry seems rather more to their taste, as shown by their inclination to infest it, to the relief of the apple, when it is growing along the side of our orchards. The strawberry crown girdler, already referred to, has been long known as one of our most common insects, but until last year it was never known to do any harm; when, all at once, it did very serious damage to the strawberries. The apple tree borers take quite as kindly to the wild crab and hawthorn, but if these wild trees are all destroyed then the borers must, perforce, take to some other plant, and what more natural than that they should attack the apple? For years the tarnished plant bug has been known as the enemy of vari-

ous of our cultivated plants; but not till two years ago did it discover the excellence of the strawberry, and then only in a small portion of a single State. It seems to have secured a patent on its discovery, as these insects in other States are not following its example. The strawberry weevil, *Anthonomus musculus*, of Northern Michigan, did great damage to this excellent fruit two years ago. Last year it seemed to telegraph its discovery to its friends in New York, and this year the plague is spreading still wider. *Agrotis fennica* has been known as a rather rare insect for years. Last year it came forth in myriads in various parts of the country and took nearly everything from the gardens where its invasions were made. Thus we might mention scores of cases where all at once insects have seemed to change their food plants and attack our cultivated plants, with serious and wide spread damage to them. Nor is this likely to grow less. Year by year our wild trees and plants are being destroyed, and so year by year are we going to suffer probably more than in the past, by attacks from insects which heretofore have rested satisfied with the wild herbage. Only last year I knew of three insects, *Agrotis fennica*, *Tripeta pomonella*, and *Otiorhinchus ligneus*, that did just this thing, and that in Michigan alone. This shows most graphically that danger from this cause is not only imminent, but that danger in the future will far exceed that of the past, as these new enemies make their attacks upon our field and garden crops.

Not long ago a horticultural writer of considerable prominence urged in one of our leading agricultural journals, that all wild trees and shrubs be carefully excluded from the vicinity of our orchards. It was argued that the presence of such vegetation would attract these insect enemies, and so bring added danger from their ravages. From what has been shown above, this seems a wrong conclusion. Facts show conclusively that the removing, not the planting of these wild and uncultivated plants is what has augmented the evil in our midst. With plenty of wild cherry trees about the orchard, the trees in the orchard will suffer almost none at all from the tent caterpillar. And how much easier to destroy these caterpillars in a few wild cherry trees than when they are scattered wide through a whole orchard. I have reason to believe that the same is true of the apple tree borers, and the apple maggot. If we have the wild haw and wild crab in goodly numbers near by, the apple trees and their fruit will suffer less; often none at all. I believe then that reasoning from the insect side of the question, we may better plant than to up-root or cut down these wild plants and trees.

Another thing which augments the damage from noxious insects is the massing of any special plant in great areas. This cuts off other plants on which the insects might feed and thrive, and insures plenteous stores right at hand, so it is easy for insects to find food and that abundantly. Thus there is little to bar the most rapid increase. How easy for the peach borer moth to find a proper nidus for her scores of eggs in such a region as our Michigan peach belt. With a single tree or a dozen, the chance of increase and spread is as nothing compared with a region where the peach, and it alone is extensively grown. For this very reason such regions as our Western shore, California, and Southern Illinois are specially liable to great damage from these insect hosts. California is now widely noted for its fruits so wondrous in their variety and excellence. It is quite safe to predict that she will soon be quite as noted for her hosts of noxious insects. A few years ago while stopping in that State I noticed an almost entire absence of injurious insects; now she takes no back seat, in this matter, as she can show as long a list as even the oldest States. Nor has she fairly commenced to show what she can do. The very fact that orchards and vineyards stretch over wide areas, that native plants are swept off as by fire to make way for the apple and the grape, the orange and the pear, the apricot and the peach, that new fruits are constantly being introduced from all portions of the civilized globe, which often contain insect enemies, and the added fact that often for miles and miles an unbroken orchard meets the gaze of the beholder; all conspire to make California especially susceptable to terrible and wide-spread invasions from injurious insects. The same is true of any other region equally adapted to the cultivation and growth of our valued fruits. To a certain extent our own Michigan lake shore is in like danger, as are also the fruit gardens of New Jersey and Delaware. It goes without saying that in all such cases

added vigilance and intelligence are required to maintain the prestige which natural advantages hand over so generously to the gardener and orchardist.

Another law, which we may denominate the "Balance of Nature," should also be noticed and discussed in this relation. Nature is broad in her charities. She aims to give all organisms a chance, and everywhere seems to give her sanction to the law of competition. In the lower orders of creation selfishness is universal. No. 1 is the watch word, and no golden rule is anywhere practiced. The strong are ever ready to kill and devour the weak. This fact undoubtedly settles many a vexed question in this matter of insect destruction. This point is well illustrated in the recent attack of our bark lice in many of the Northern States. These lice were unusually abundant and indiscriminate in their attack on different trees two years ago, while the predaceous and parasitic enemies were very few. Last year the lice had spread widely. Many trees were suffering terribly from their attack, and to find a tree entirely free from the lice was rather the exception. The enemies, too, were quite common. This year we find the lice so preyed upon by insect enemies that over 90 per cent, by actual count, are destroyed. While we have reared nine different parasites in prodigious numbers, which were working to overcome these pestiferous lice, we also found many predaceous insects and several birds, notably the common sparrows and Baltimore orioles, which were feeding upon the lice and devouring them by millions. In this case the plants came near becoming the victims of the sapping lice. Yet, just as the trees commenced dying, before very great destruction had ensued, the enemies of the lice came to the rescue of the plants, the lice are devoured, the trees are saved. Next year the lice will be few, the numerous parasites will find insufficient food, and they in turn will die of starvation. Thus starvation comes to avenge the lice, as the parasites came to avenge the plants. Now, as the parasites are swept off by famine, the few remaining lice, for a few will always escape even these eagle eyed parasites, multiply with startling rapidity. We have counted over 3,000 eggs under a single scale. Soon the trees are again robbed of their life sap, and are again saved by the parasites which, not quite all dead of the famine, rapidly come to the front, as they are equally prolific with the lice. Thus, in this wonderful balance of nature, it is rare for any species to be blotted out. Each organism seems to have some enemy which slays its increase within certain limits, and some friend which comes to its rescue when the struggle is too pressing for its own unaided strength. Is it out of place, Mr. President, to pause a moment in deepest humility, admiration and reverence before the All Wise Planner and Creator, who with infinite wisdom prearranged that this wonderful balance in nature should ever be preserved? One failure, and all is lost. Suppose the blighting insects were unmolested till the herbage was all consumed. As plant food is the basis of all food, soon all life would fade out. Though the evidence is overpowering that the evolution of organisms has arisen largely through and because of adaptation, yet in the wonderful complication of the machinery of nature what infinite wisdom was required that there should be no failure in the wonderously complex adjustment of the various parts. This fact of oscillation of species from few to many, consequent upon the scarcity or abundance of their enemies—the parasites and predaceous insects—accounts for the frequently observed fact of "insect years." Whatever may enfeeble or overcome these parasites serves to let loose our enemies, and the insects come as a plague, as is often seen in case of the Hessian fly, wheat midge, cut worms and army worms. Quite likely there may be other causes, climatic meteorological, fungous attack, etc., which may require long years of investigation to make them well understood. We know of a surety that a winter of great severity often causes extensive mortality among some insects; that an early spring frequently so accelerates development that insects hatch, when a sudden cold spell retards vegetation and the insects all die. Such an occurrence has more than once thinned almost to extinction the tent caterpillars of our Northern States. We also know that fungoid disease is reducing the numbers of our cabbage caterpillars and other larval and adult insects. Yet investigation is needed to further our knowledge in these matters. It is not improbable that research may develop information in regard to theabove subjects which shall be of vast economic importance to the farmers and horticulturists of our country.

I am aware that this picture of insect destruction, especially the alarming increase which in prospect is darkly foreboding, is a very sombre one. Yet in all our history, in the history of civilization everywhere, new dangers have been met with new and more excellent weapons. Rapid traffic as by railroad, demands even more speedy transit of thought and knowledge. Hence the railroad is hardly in advance of the telegraph. Is it too much then, to expect that as insect depredations become more formidable, insecticides will become more common and efficient? Even now with all this multitude of insects which are working to rob us of our hard-earned products, it is a question, if in the aggregate more real harm is done than in the olden time when their number was far less. Already we have numerous and efficient remedies for many of our worst insect pests. Many valuable insecticides are already before the public, and year by year we are discovering more approved methods of applying these remedies. It is more than probable that with a little opportunity, or stimulation, invention and discovery will more than equal the rapidly increasing danger already referred to. France which has reaped such wonderful fruits from researches like those of Pasteur, recognizes the need and wisdom of such stimulation, and hence such munificent rewards, for research as already referred to.

France recognizes the fact, which is more and more apparent, that we need more scientific knowledge. The full life-history and habits of every insect, whether friend or foe ought to be, must be, thoroughly investigated. The most powerful key that can be used to unlock the important economic problems which touch the very pockets of our people, is this same accurate scientific knowledge. Franklin and Farraday were the necessary forerunners of Field and Morse. Every one of Pasteur's great discoveries in economic matters has been born of thorough scientific knowledge and discovery. The entomologist who has studied the haustellate mouthparts of bugs and lice, will not attempt to kill them by use of poison on the surface of the plants they infest. We as a nation greatly need more knowledge of the hosts of insects. And it is more than economy, it is the highest wisdom, to secure pure scientific research. We should have a goodly number of scientific investigators, who should work with the highest skill and energy to develop new scientific facts. Science should paint the full life-history of every insect that is found in our country, should discover all the close relations that play between the several kind, of insects, how they are affected by changed conditions of environment, of climate, of atmosphere, the inter-relationship between insects and fungi. All this knowledge is the prerequisite to a wise consideration of the subject of economic entomology. We assert then, emphatically, that the first important step is thorough scientific study of all our insects.

Hardly less important than scientific knowledge is wide experimentation guided by a thorough knowledge of the structure and habits of insects. The entomologist knowing that the first brood of the codling moth attacks for the most part our early fruit, would surely conduct experiments in spraying with poison more satisfactorily than one who had no such knowledge. So, too, one who knew that the apple maggot attacked only fall fruit, and that the apples nearly all fell before the maggots left the fruit, would think at once to quickly feed the windfalls as a very perfect method of treatment, while a knowledge that the codling moth larva as often leaves the fruit before it falls as afterward, would show that turning hogs in an orchard would need to be supplemented by some effort to fell the fruit to make it a thorough remedy. Thus in every field of economic entomology thorough scientific knowledge should guide thorough experimentation.

Thus we need an experimental station in every State, where competent entomologists may not only investigate all our insects as to structure and habits, but where at the same time the most careful and painstaking experiments may be carried on. There can be no doubt but that money judiciously expended to inaugurate and fully equip such stations would be most wisely appropriated, and would bear actual fruit a hundred fold. The plan now before Congress to unite these stations with our agricultural colleges has certainly much to recommend it. Who could teach so well as a live, energetic investigator? And his teaching, if confined to this field, would aid rather than detract from his usefulness as a scientific student and investigator. Again, what a powerful educating influence would these very

researches and experiments be to the eager, earnest students who gather at these colleges. Apt students could be secured to aid in the work, and would gain knowledge that would be not only very useful to themselves in their future work, but also useful to the States and Nation.

Mr. President and gentlemen, I have refrained from speaking of special insects and remedies at this time, thinking it more important on such occasions to treat important principles. The other can be best disseminated in the agricultural and horticultural papers, and the best considered in the quiet of home and office. But here, this Society, which is National, may better consider such matters as are wide in their importance and influence, and may better give attention to questions that are comprehensive, and will, if rightly solved, reach with beneficent touch all down the ages. So here in this matter of economic entomology, what better work can this North American Pomological Society do than to urge upon our legislative authorities and upon Congress that aid be granted to this work of entomological research and entomological experimentation. The demand of this Society would have, and justly so, very great weight, and might be the determining influence which should arouse action that would bless the world.

DISCUSSION ON THE LECTURE.

P. M. Augur, Connecticut: I would like to enquire about the apple maggot which has been injurious this season in the Eastern States, especially on early varieties.

A. J. Cook: We have not known it in Michigan until the past year. It took only early fruit, especially that ripening in September. A barrel of apples shipped to me was so badly infested with it that there was hardly an apple that we could do anything with. It is much worse than the Codling moth as it does not remain about the core as that does, but passes through and through the apple, entirely spoiling it. I think I have taken as many as fifteen or twenty maggots from a single apple. They leave the apples by the last of September, and always cause the apple to fall so far as I know.

P. M. Augur, Connecticut: I have also found them in the barrels in the best winter apples; have they more than one brood in a season?

A. J. Cook: They have but one brood.

A long discussion on insecticides followed; most of the points in which I have already been widely published. Among the new or less known points were the following: Mix Pyrethrum with four or five parts of flour. Gas lime water for the cabbage worm, made by rubbing the inside of a cask with a spoonful of gas lime, and filling the cask with water (J. B. Rogers). Burning straw over the strawberry plants for the tarnish plant bug. The effectiveness of Pyrethrum is increased by the addition of alcohol (J. S. Woodward).

FRIDAY—MORNING SESSION.

The meeting was called to order at 9 o'clock, Patrick Barry, of New York, in the chair.

Commissioner Colman, of the Department of Agriculture being present, was called upon for some remarks on what the department can do to promote the Horticultural and Pomological interests of the continent.

Mr. Colman said:

Mr. President and Gentlemen:—I feel complimented by being called upon to make a few remarks to this body. As has been said by my friend Dr. Hexamer, I believe that I am the first commissioner who has been appointed to take charge of the agricultural interests of our country who by taste and profession was a horticulturist. And I have said in former years, before I had the honor of being appointed to this position that much might be done to advance the interests of pomology and horticulture generally. So in taking my seat, the first thing I did was to look about and endeavor to ascertain how I could promote those great interests. As some of you, perhaps, have been informed I gave attention at one time to the subject of fungi in plants. I knew of the great losses that had been sustained, not only by our fruit-growers, but also by the farmers of our country by mildew, rust, blight and other injurious fungi. I therefore cast about to ascertain who would be the proper person to investigate these diseases and see what remedies might be applied to prevent the devastating effects of fungi; and I appointed Prof. Scribner, who was highly endorsed by the gentleman who has addressed you so ably upon this subject (Prof. Bessey). Prof. Beal also speaks in the very highest terms of Prof. Scribner and his careful investigations on these subjects. I would be particularly honored to have you render him any assistance. If you are not already informed in regard to his work I should be glad to have you correspond with me or him concerning it.

I came here gentlemen to learn, I knew that I should meet here the advanced thinkers and progressive men in regard to the agricultural and horticultural interests; for horticulture is but a higher and more elevated branch of agriculture, and in horticulture we find our closest students, our best thinkers, our most progressive men, our most philanthropic men. Now there are various things to embarrass the department at present in advancing our interests: Take for instance the collection of statistics. Everything relates to the grain crops only. No efforts have been made to ascertain anything in regard to our fruit crops. There is no way by which we can tell the amount of apples produced in this country. I understand that in this State statistics have been collected and that the marketable crop amounts annually to something like a million dollars. It is safe to say that the marketable apple crop of the country is worth from twenty to forty million dollars. It then has a commercial value, as well as wheat or corn which is exported.

In some localities this crop is abundant in one year, in others the next, and it seems to me that statistics should be gathered so that the people may be informed of this. The same may be said in reference to our other fruit crops. As yet no machinery has been organized for this purpose, but I believe that I shall be able to organize such machinery to the great advantage of our pomological interest. I have always thought that horticulture should have a bureau in the department, with a pomological division, having one of the best pomologists of the country at its head and, though I have not yet seen a way to establish such a thing legitimately, I am looking to the formation of a bureau which shall have in charge these great industries. We know of the mistakes that exist in the matter of nomenclature, and if we had a bureau where our fruits could be properly named and classified it would be of great advantage.

As many of you know, we called a meeting not long ago of representatives of agricultural colleges, which was largely attended, and a connection was formed between the Department and all the agricultural colleges of the country. I am

anxious that these colleges and the various experiment stations shall be the experimental grounds of the Department, where the various seeds and plants can be sent to be tested to ascertain which are best adapted to that locality, and from whence they can be distributed.

Mr. Leo Weltz, of Ohio, is now in Russia collecting various plants and fruits for the Department, to be tested to determine their adaptation to the northern part of this country. Prof. Budd and others urged upon me the importance of having this done, and we know the benefit derived from the obtaining of hardy fruits from that region by himself and Mr. Gibb. I am also making arrangements with the Consuls of various nations to collect such fruits and plants as it may seem of advantage to introduce.

I am in sympathy with you and am working for your welfare, and I want your aid and co-operation in the work in which I am engaged. I want to get the machinery at work so that when a change of administration comes it will continue to run on to the mutual advantage of us all.

In the matter of forestry little has been done by past administrations—nothing of any practical value. I am trying to get that machinery at work, because we all know how our timber is being devastated. I am putting men at work who, I think, will do something practical. I have gathered for our agricultural colleges and experiment stations, and for our arboretum, various trees and seeds, to determine their adaptation to different sections of the country, and I expect great good will come from it.

Now, in conclusion, I would again solicit your aid in this work. You have no idea of the weight of responsibility that I feel resting upon me. I am anxious to do all I can, but I am powerless to do it unless I have your sympathy, aid and co operation. And I wish to assure you that I want your suggestions. I want you to write me freely, and I can say that any advice you give will be received as from a brother. Thanking you for your attention, I will not occupy your time any longer.

At the close of Commissioner Colman's remarks W. J. Beal, of the Agricultural College, Michigan, offered the following resolution, which was unanimously adopted :

Resolved, That this Society heartily commends the action of Commissioner Colman of the United States Department of Agriculture in the appointment of a person to investigate the diseases of plants, and desires to assure him of continued support in his efforts to develop this new line of work in the Department.

The following telegram of greeting was received from the Kentucky Horticultural Society with an invitation to hold the next meeting in Kentucky :

LOUISVILLE, Ky., Sept. 16, 1885.

To the American Pomological Society:

The Kentucky Horticultural Society sends greeting and an invitation to hold your next biennial meeting as our guests in this city.

J. W. MCKAY, Sec'y.

The Secretary was authorized to return a message of thanks.

The subject of grapes was then continued from the last evening's session with the following paper entitled

AMERICAN GRAPES.

BY T. V. MUNSON, DENISON, TEXAS.

Importance of Botanical and other Scientific Knowledge to the Progressive Horticulturist, and Especially to the Viticulturist.

As the horticulturist has constantly to deal with various species of plants—live beings—he must know something of their structure, methods of growth, their constituents, so as to select their foods. He must know something of their relationships, the climates and soils in which they received their birth and development, that he may still preserve their vigor and productiveness. He must know the structure and functions of their reproductive organs, so as to make the most desirable crosses and hybrids, and secure the most perfect fertility and development of fruit. When we consider that here, in the United States alone, there are some fifteen different species of grapes, with different adaptabilities and properties, with innumerable varieties of each, that all the species are polygamous, and are capable of intermingling, thus making hybrids, and that we must at least use several of these species conjointly to secure greater excellence in quality and make rapid progress; it is at once apparent how important is a knowledge of grape botany at least to the successful vine-grower, and still more to the originator.

The horticulturist must know of the diseases —the fungi, the animalcules, the insects, etc., which prey upon his different varieties ; their

habits and times of feeding, breeding, hibernating, etc., in order to destroy his enemies and save his friendly insects and crops. He must find the most vigorous and resistant varieties and the means which will kill or prevent disease. He must know something of chemistry, that he may not give a poison rather than a food in his manures. In a word, he must not only know something of botany, but must be, in his sphere, a practical scientist, to become eminent in his calling. Our able leaders recognize these truths; hence we have scientific Agricultural Colleges and Experiment Stations, supported at public expense in the various States, and that you see gathered here in this great horticultural meeting our ablest botanists, entomologists, micrologists, meteorologists, agricultural chemists, experimentalists, as well as the clear-sighted, practical specialists in horticulture. Your venerable President well knows the need of all these, and more, in educating this great Nation to a high standard in pomology.

SUPERIORITY OF THOROUGH-BREEDS.

It is only through the practice of the principles of evolution that a thorough-breed can be obtained. Every species is one of nature's thorough-breeds. It is the product of "natural selection." What a vast field opens here to the educated experimenter!

The thought almost inspires him with the feeling that creative power is, to some degree, within his control. Who but the experimenter brought into existence, created as it were, many of those rarest gems upon your tables there!

If all these wondrous works have come up, and up through countless cycles, and metamorphoses from the chaotic nebulosity of a past eternity; if from the slimy algæ floating on, and the protoplasmic diatoms jellying in the bottom of the ancient seas have come up such infinite strides, and now reside, as their cell-structure indicates, in those lucious fruits and gorgeous flowers, where may we not expect the keen selecting intellect of man may carry the development in the infinite future! This makes life worth living, to see this and the heaven the future may unfold.

When I speak of evolution, it is far from my desire to intrude a thought or insinuation upon theology. I am discussing principles recognized and practiced in horticulture, agriculture stock-breeding, in fact in all practical life, by the ablest minds, in every substantial pursuit, the world over, and which are so beautifully set forth in that great work, "Darwin's Variation of Animals and Plants," and whose study no progressive horticulturist can afford to neglect.

Stock-breeding is far in advance of pomology to-day. While we are just taking the initial steps of selecting the best wild varieties from the different species, and crossing or hybridizing, to get desirable qualities to base a breed upon, which may eventually be reduced to a permanent type, always reproducing itself in valuable forms direct from seed, thus eliminating the disease-producing processes of budding and grafting; the stock-breeder, and even the grain and vegetable grower, has already advanced for hundreds and thousands of generations with many breeds and continues to improve all the time. True we have some intimation of a thorough-breed in the Concord grape and its numerous valuable progeny, and in some other fruits. But then we are neglecting one vital principle of evolution, necessary to maintain permanent vigor. The rapid approach of "rot," (more to be dreaded than ever was phylloxera), and other diseases in the Concord family indicate this, just as anthrax, rot, mildew and phylloxera have invaded the long in-and-in-bred *Vinifera*. Other valuable strains should be crossed or hybridized upon these occasionally to beget new life and resistance, not at random, giving only straggling half-breeds or scrubs, with no characteristic type that can be maintained, but with the utmost discrimination, studying every "point" as do our best stock-breeders. Herein is great danger, as greater weakness can more readily than strength, be inoculated and the breed ruined.

We must have different families of Labrusca, Riparia, Æstivalis and every other valuable species of native grape so that we shall be at no loss for material to secure healthful crosses. The Concord family is not enough for Labrusca. It can afford more, and perhaps better. Ives presents the basis of a very vigorous, rot-resisting and probably better qualitied family. So does Perkins, Dracut Amber, and some others. Who will raise them? We have a small Clinton family, a hybrid of Labrusca with the N. E. Riparia, and a much more promising

Taylor family, from Riparia hybridized with Labrusca. Mr. Jacob Rommel has been chief in developing this. To him the west owes a debt of gratitude.

Much experiment is needed here to direct us aright. To this end have I devoted much valuable time with the grape, and am in the midst of many experiments. I find some varieties are excellent breeders of choice kinds, with various crosses, while others breed poorly with almost everything else. Some breed finely with certain strains, and with others poorly. Lindly is one of the best breeders, and easy to manipulate, having reflexed stamens. Elvira breeds poorly with Concord, but well with some others. Our post-oak varieties prove to be excellent breeders with other strains, so do the rupestris varieties, and the day is not far distant, when from these iron-clad sources will come to light astonishing results.

With this paper I submit the tabulated facts of part of my experiments. The table is too long, Mr. President, to read here, and could not be remembered if I did, so I hand it in for publication in your next report.

However some of the general deductions may be interesting and useful here, so I present them.

(1.) SPECIES OF AMERICAN GRAPES.

Though little new there is to note as to the number and general specific characteristics, yet some valuable points have been discovered. To the more readily make these understood an epitome of my new arrangement of the species is presented.

There are no less than fifteen distinct species of the grape in the United States, when classified according to natural distribution, development and adaptability to climate and soil, and by physical markings. These seem to be most naturally related in the following order: (Some foreign species are included for comparison).

(1.) Riparian Group.
- 1. Vitis riparia.—Riverside Grape, from Texas, and Colorado N. & E. to Manitoba and the Atlantic. Taylor and Clinton show it in part.
- 2 " Nuevo Mexicana.—Woolly Riparia of the ravines of N. W. Texas, New Mexico, and Colorado.
- 3 " rupestris.—Bush, Sugar, or Sand Beach Grape, from E. Tennessee in hills westward to S. Mo., Ind. Ter., and W. Tex.
- 4 " Arizonica. — Arizona Grape, of Arizona and S. California.

(2.) Frost Grape Group.
- 5. Vitis palmata, or rubra.—Palmate leaved Grape, Miss. River, above St. Louis.
- 6. " cordifolia.—Frost or Sour Winter Grape, from Colorado, all E. United States S. of 42 deg.

(3.) Meaty fruited, Fleshy Rooted Group.
- 7. Vitis Californica. — California Grape, Oregon and California.
- (*a.*) " vinifera—Old World Grapes.
  - 1. A riparian leaved, meaty fleshed group of varieties like Tokay, Chasselas, etc.
  - 2. A cinerean, or vinous group of varieties like Pineau, Burgundy, Riesling, etc.

(4.) Hard wooded Summer Grape or Æstivalis Group.
- 8. Vitis monticola.—Mountain Grape, hills of Central Western Texas.
- 9. " cinerea.—Ashy leaved, or Sweet Winter, dry alluvial bottoms from W. Tex. E. to Atlantic, and from 40 deg. S. to the gulf.
- (*b.*) " Romaneti, } Central South-
- (*c.*) Spino-vitis Davidi, } ern Asia & China. These seem to stand between cinerea and æstivalis.
- 10. Vitis æstivalis.—Eastern Sum. Grape, N. Y. to Fla E. of Miss. River. Norton's Virginia, etc.
- 11. " æstivalis Lincecummii. — Post-Oak Grape, of Mo., Ark., Ind. Ter., Tex. & La. Many large fruits, fine varieties brought into cultivation by H. Jaeger and myself.

(5.) Woolly leaved Group.
- 12. Vitis labrusca—East Atlantic Slope. Concord, Ives, etc.
- 13. " bracteata, (Raf.), or Caribæa? Middle and S. Fla.
- 14. " candicans—Mustang Grape, N. Cent. and S. W. Tex.

(6.) Warty wood Group.
- 15. Vitis rotundifolia — Scuppernong and Muscadine of all the Southern States south of 36 or 37 deg.
- 16. " Floridana (Raf.)—Florida Grape, first noticed in 1830 by Rafinesque. Recently re-discovered in S. Fla. by Mr. J. H. Simpson, and identified by myself.

Of these species, 1, 2, 3, 4, 7, (*a*), and 12 grow easily from cuttings, while all the others grow with more or less difficulty.

These species which grow most easily from cuttings, usually succeed best in high, dry climates or a climate like that of California, except labrusca, which does better in a climate like that of the Atlantic States. The limestone and alluvial soils suit 4, 5, 6, 7, 8, 9, 12 best, while 1, 2, 3, 10, 11, and 15, succeed rather better in sandy, gravelly, or clayey soils, but a well drained loamy sand upon a ferruginous calcareous clay base, suits them all. Bottom situations are naturally chosen by 5, 6, 9, and 15, while 4, 7, (*a.*) 8, (*b.*), (*c.*), 10, and 11, love high, dry loamy hillsides. 1, 2, 3, love high, dry sandy river banks, or sandy beds of dry ravines and canons. 13 and 14 are found in dry, alluvial, sandy or limestone bottoms or limestone bluff lands. 1, 2, 3, 4, 8,

9, 11, and 14, endure intense drouth; 1, 2, 3, 8, 12, endure great cold, especially so their northern varieties. 1, 2, 4, (*a*.), 8, and some varieties of 11 are subject to mildew in climates of great and sudden changes in moisture, as in the lowlands of the lower Mississippi valley. Rupestris seems steel-clad in every respect, so is rotundifolia except as to cold, and measurably so 6, 8, 9, 10, 11, and 12. 11 and 12 are in part of their varieties, victims of rot, while in others quite exempt, while (*a*) is so susceptible to that and most of the other diseases, that of many varieties tried in thousands of places in the United States east of the Rocky Mountains, none have proved entirely exempt; but in California this species (Vinifera) seems perfectly at home, except as to mildew and Phylloxera in some localities. The eastern æstivalis and part of the western, seem never to rot. The western Post-Oak endures great hardships, often producing fine large fruit in the wild state and with rupestris, riparia, cinerea, and labrusca, offers material from which the experimenter may produce all desirable results that may reasonably be expected among grapes, without vitiating, as has been so largely done, our vigorous American blood with the disease-stricken Vinifera. Scuppernong should be added for the South.

The originator of a fine hybrid of labrusca and vinifera cries out, "sack your grapes, dust them with sulphur, cover them with earth in winter, etc.," when the planter complains of rot, mildew and tenderness. But with the hard-working, practical vine-grower such varieties as Ives, Perkins, Worden, Draeut Amber, Missouri Riesling, Empire State, Rommel's best kinds, Jaeger's best rupestris, Norton's Virginia, the fine rot-proof varieties of Post-Oak, of the southwest, and Scuppernong, of the Gulf States, will preferably be planted. Occasionally a rare hybrid like Delaware, Triumph, some of the Herbemont group and a few others, will be retained. Yet we cannot make our selections entirely according to botanical species, though a knowledge of species will be found of immense value, especially to the experimenter. An exact knowledge of each variety must be had in various soils, climates and treatments, hence the importance of experimental stations in various parts of the country. This is why I present herewith a tabulated view of tests, or notes taken upon numerous varieties. These notes would be of much value to the general planter in the southwest where a similar climate with that of Indian Territory, Texas, Arkansas and Missouri prevails, and to the experimenter everywhere.

(2.) STAMEN CHARACTERISTICS.

So far as observed in thousands of bearing vines of the pure species, the riparia, rupestris, cordifolia, cinerea, æstivalis and candicans, always have reflexed stamens, and if standing at a distance from vines having erect stamens, will not set much fruit, yet will bear abundantly if varieties with erect stamens, blooming at the same time, stand near. They are practically pistillate, like Crescent strawberry and need fertilizers. These they naturally have, as over half the wild vines are purely staminate or male, bearing superabundantly of pollen, but never a berry.

Flower of bearing vine with reflexed stamens, like Rogers 9 (Lindley.)

Fig. 1.

Non-fertilizing.

Flower of bearing vine with erect stamens, like Concord.

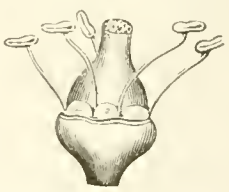


Fig. 2.

Self-fertilizing

Flower of male, or pollen bearing vine.

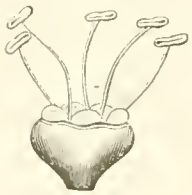


Fig. 3.

Non-bearing.

Lindley and most all varieties with reflexed stamens, if planted alone in vineyard, are almost fruitless, but planted among Lady, Martha, Concord, or many others, quickly selected by the use of the table, having erect stamens and blooming at same time with Lindley, or still better, if you can get such, male plants blooming at same time, and the reflexed stamened varieties bear heavily.

This important principle cannot be too strongly

emphasized. The lack of cross-fertilization is the cause of much loss to fruit-growers. The varieties to be cross-fertilized, must bloom within the same period, and better to have the variety to be fertilized to begin blooming a day after the one which is to furnish pollen. A grape vine remains in bloom from three to eight days, and each flower must be fertilized the first or at farthest, the second day after it opens. In the wild state the male vines begin blooming a day or two before the bearing vines. This and the fact that over half of all wild vines are males, gives us a hint which we cannot neglect, without loss in crop, or the experimenter without impairing the longevity of his varieties and breeds. Even the bearing vines with erect stamens do better if some properly selected males be planted in the vineyard. I know of but one vineyard planted upon this principle, and that is a new one by H. Jaeger, of Missouri. We hope in a few years to learn the results. To further illustrate this principle and the healthful influence on the seedlings, let us take a few examples.

One of my seedlings having reflexed stamens, had two clusters with part of the flowers just ready to cast the caps, (bloom) when I lifted the caps and applied pollen from Berckmans, (an erect stamened kind) and then enclosed the clusters in thin muslin sacks, with part of the flowers yet to bloom. These bloomed the next day or two, but instead of setting fruit, every one soon withered and fell away, while those fertilized with pollen from Berckmans, set and matured fruit.

Concord, Clinton, Triumph, Norton, Herbemont, and all other erect stamened varieties, from which I have grown seedlings, make feeble plants when pure-bloods, that is, self-fertilized, in comparison with crosses or hybrids with other varieties and species.

Indeed, it seems a pretty well established fact, that if a variety's own pollen, even if it has erect stamens, and that of another erect stamened variety, especially so if from a male vine, be applied to the stigma at the same time, the pollen of the other variety will be chosen, its own rejected, and the seeds will be crosses or hybrids. In artificial hybridizing, it is quite useless to cut away stamens on varieties where they are short and reflexed. Thus we learn that nature abhors in and in breeding, even in plants.

Nearly all varieties of labrusca in cultivation, and a goodly part of those of vinifera have erect stamens, hence I conclude that these species, generally, both in bearing and sterile plants have erect stamens, though actual observation in wild nature would be necessary to establish the point. The important truth remains, that if only one variety is planted in a vineyard, it must have erect stamens, in order to make a crop.

As to the stamen characteristics in Californica, Arizonica, palmata, Caribæa and rotundifolia species, I have not yet observed.

Norton's Virginia and some known hybrids between æstivalis and cinerea have erect stamens, hence the conclusion, that erect stamens in bearing vines are partly the result of hybridization. Why labrusca in its pure bloods has erect stamens in bearing vines, and continuous tendrils, while no other pure species have these, only the hidden work of past cycles of evolution can explain.

On this subject of far-reaching importance, I trust you will see the great value of a correct table, such as is attempted here, so far as the tests and notes have been made. Though I believe myself the first, who has ever compiled and made known such a table, yet I hope it may not stop here, but be added to, till it shall become a manual with every grape-grower, as it almost necessarily must with every successful originator.

In this table you find the common and botanical name, origin, growth, hardiness North and South, readiness with which the cuttings root, time of leaving out, blooming, kind of stamens, diseases affecting, and description of fruit with time of ripening of a large number of different varieties of our American species of grapes, and some foreigners. So you will find, when you come to study this table in the society's printed report, that I have treated upon our grapes at a far greater extent than it is proper to read here, though in the conciseness of tabulation.

(3.) EFFECTS OF CROSSING AND HYBRIDIZING FURTHER CONSIDERED.

This is a subject within itself worthy of a book. Permit me to present a few facts more and I am done.

1st. In growing thousands of seedlings, the hybrids have almost invariably shown greater

vigor the first two or three years than pure-bloods.

2d. Many of the hybrids sicken and remain puny, much more so than the pure-bloods.

3d. Some of the hybrids continue permanently very vigorous. Well-known examples of permanently vigorous hybrids are found in Warren, (the original vine still standing in Warren County, Georgia, hale and bright, with a circumference of over thirty-three inches near the ground), Herbemont, Louisiana, Taylor, Elvira, a few of Roger's hybrids, with some other labrusca and vinifera hybrids, Norton's Virginia is a remarkable instance, Jaeger's æstivalis and rupestris hybrid "No. 70." and many more of purely American parentage.

4th. Many of the pure-bloods, weak or slow at first, become permanently vigorous, especially so if crossed with other varieties of same species.

5th. Seedlings of varieties having reflexed stamens, and which were chiefly crosses or hybrids through this circumstance, are generally very vigorous and remain so.

6th. Hybridizing ameliorates or refines quality in most cases, often making varieties better than either parent. The Norton's Virginia, I feel quite sure possesses cinerea blood. I have pure seedlings of it very late, and quite like the sweet winter grape; and Norton itself shows cinerea markings, though it is mainly æstivalis. Ronk's Blue, which is most certainly a wild hybrid of labrusca with cordifolia, has a fruit and cluster the size of Ives, and of a superior quality to Norton, with a melting honeyed pulp.

Several hybrids between æstivalis and cordifolia and æstivalis and cinerea, found wild in Texas, are superior to any pure-bloods of either of these species yet found. Taylor, Clinton, and their numerous fine progeny attest this fact. In searching for good, wild varieties (and I have scoured the woods of Texas and Indian Territory, largely in these critical, lonely rambles on horseback, besides receiving specimens from every quarter of the United States), always the best varieties have been found where two or more species, which readily mix, grew in the same vicinity.

There are, however, some crosses and hybrids, which produce unbearable fruit, such as that of a Frost Grape with a Mustang. The size of the Mustang is reduced and the biting acridity of both species is intensified.

(4.) DISEASES.

This is entirely too large and difficult a subject for a paper like this. In my table I have noted opposite each variety its chief diseases, but each of those diseases has a history and character of its own, as well as several other diseases of the grape, not named, which alone make the matter of a book. Such a book exists in that recent able and beautifully illustrated French work of Pierre Viala, which should by all means be translated for the use of American vine-growers.

I would, however, as a hint, make this general statement, borne out by experience, both in the United States, and in France, that even commonly resisting varieties are more liable to become infected in a region where diseased varieties abound than where they do not, just as a crop suffers more and needs more culture in weedy land than clean.

Leaving off as I began, it seems to me that the greatest permanent progress will be obtained by starting with judicious selections, from nature's best varieties, and then carrying forward the process of reproduction, by crossing, hybridizing and re-selection of only the most perfect products continually, by degrees. Great jumps in hybridizing widely divergent species should be avoided, as we are liable to get only a mule or mulatto,—bad things to breed from—and remember, great jumps are dangerous to vitality as is also stagnation. Varieties, like individuals have their vigorous youth, useful maturity and hobbling decrepitude. So we must provide for new varieties and families, as well as new individuals, if we would hand down to posterity a valuable inheritance. This is properly the work of the faithful experimentalist, and he should be a man of eminently practical ideas. To such is this paper chiefly directed, though I flatter myself, that the practical vineyardist also, will find some points presented, interesting to him. As to planting, culture, pruning, and the handling of the crop, it is not the object of this paper to discuss.

To my more experienced and abler compeers on this eminent topic of American grapes, I submit, thanking you heartily for honoring me with your kind attention; and you, Mr. President, for the confidence you placed in me in calling me to assist in handling this intricate subject before this great society.

MUNSON'S DESCRIPTIVE TABLE OF GRAPES.

(W.—Weak. V. V.—Very Vigorous. H.—Hardy. T.—Tender. L.—Large. M.—Medium. S.—Small. E.—Erect. Ref.—Reflexed. Ea.—Early.)

NAME: Common	NAME: Botanical (from what species derived)	ORIGIN: Place	ORIGIN: Originator	CHARACTERISTICS OF PLANT: Growth	Hardiness: South (Endures Heat)	Hardiness: North (Endures Cold)	Cuttings Root	Time of Leaving Out	Bloom at Denison, Tex., 1885	Stamens	DISEASES: Anthrax (Sphaceloma)	Rot (Phoma)	Mildew (Peronospora)	Root Louse (Phylloxera)	DESCRIPTION OF FRUIT: Size: Clus'r	Size: Berry	Ripe	Color	Skin	Pulp	Number and Size of Seeds	Quality: Table	Quality: Wine
Sugar or Sand Beach	Vitis Rupestris	S W Mo	....	V. V.	V. H.	V. H.	Easily.	V ea.	Apr 24.	Ref.	None.	None.	None.	R. prf'y	V. S.	S. to M.	Earliest.	Black.	Thin, firm.	Melting.	3 to 5 s.	Pure, fair.	Fine Claret.
Woolly riparia or N. Mex.	" Nuevo Mexicana	Nw Tex	....	V. V.	V. H.	V. H.	Easily.	V ea.	Ap 24-8.	Ref.	None.	None.	Severe.	Resists.	S. to M.	S.	V. E. to M	Black.	Thin, firm.	Melting.	3 to 5 s.	Fair to fine	Fine Claret.
Riverside	" Riparia (proper)	N. Tex.	....	V. V.	V. H.	V. H.	Easily.	V ea.	Ap 24-8.	Ref.	None.	None.	Little.	Resists.	S to M.	V. S.	V. E.	Black.	Thin, firm.	Seedy.	3 to 5 s.	Too small.	Vinous.
Bacchus (Clinton)	" Lab-riparia	N. Y.	J. H. Ricketts.	V. V.	H.	V. H.	Easily.	V E.	Apr 28.	Erect.	Some.	Some.	Severe.	R. well.	M.	M.	M.	Black.	Thin, firm.	Pulpy	1 to 3 m.	Fair.	Good Claret.
Mustang, hyb.	" Candicans and Riparia	RR Tex	Found wild.	V. V.	V. H.	H.	Fairly.	V E.	Apr 28.	Ref.	None.	None.	None.	R. prf'y	S to M.	M.	E.	Black.	Thick, firm	Pulpy.	3 to 5 s.	Poor.	Good Claret.
Berckmans	" Lab $\frac{1}{4}$ Rip $\frac{1}{4}$. Aest $\frac{1}{4}$ Lab $\frac{1}{8}$ Vin $\frac{1}{8}$	S. C.	Peter Wylie.	V. V.	H.	H.	Well.	Ea.	Apr 30.	E.	None.	Some.	Some.	R. well.	M.	M.	E.	Red.	Thin firm.	Tender.	2 to 3 m.	Excellent.	White.
Mustang	" Candicans	Texas.	....	V. V.	V. H.	T.	With dif	Ea.	May 1.	Ref.	None.	None.	None.	P'fectly	S.	L to V L	E. to M.	Black.	Th'k, acrid	Tough.	3 to 5 m.	"No go."	Heavy Claret
Secretary	" Lab-rip (Clinton) vin	N. Y.	J. H. Ricketts.	V.	H.	T.	Easily.	Ea.	May 1.	E.	Some.	Severe.	Severe.	Poorly.	Lg.	M.	M.	Black.	Thin.	Tender.	1 to 3 m.	Good.	Heavy Claret
Mary Ann	" Labrusca	Pa.	J. B. Garber.	V. V.	V. H.	V. H.	Easily.	Ea.	May 1.	Erect.	None.	Some.	None.	R. well.	M.	M. oval.	V. E.	Black.	Thick.	Tough.	2 to 4 m.	Poor.	Poor
Golden Gem	" Aest, lab-vin, Del-Iona	N. Y.	J. H. Ricketts.	V.	H.	H.	Fairly.	Ea.	May 2.	E.	None.	Some.	None.	Fairly.	S to M.	S. to M.	Ea.	Yel.	Thin, firm.	Tender	2 to 3 m.	Excellent.	White.
Waverly	" Lab-rip, vin Clinton-Muscat	N. Y.	J. H. Ricketts.	V.	H.	T.	Easily.	Ea.	May 3.	E.	Some.	Severe.	Some.	Fairly.	Lg.	M.	M.	Black.	Thin, firm.	Tender.	2 to 3 m.	Good.	Red.
Perkins	" Labrusca	Mass.	....	V.	H.	V. H.	Easily.	Ea.	May 3.	Erect.	None.	V. little	None.	Resists.	M.	M.	Ea.	Red.	Firm, med.	Some.	2 to 4 m.	Good.	Fair White.
Telegraph	" Labrusca	Penn.	Christine.	V.	H.	V. H.	Easily.	Ea.	May 3.	Erect.	None.	Some.	None.	Resists.	M.	M.	Ea	Black.	Thin.	Some.	2 to 4 m	Good.	Good Red.
Hartford	" Labrusca	Conn.	Steele.	V. V.	H.	V. H.	Easily.	Ea.	May 3.	Erect.	None.	Some.	None.	Resists.	M.	M.	Ea.	Black.	Thin.	Some.	2 to 4 m.	Fair.	Poor.
Elvira	" Riparia-labrusca	Mo.	J. Rommel.	V. V.	H.	V. H.	Easily.	Ea.	May 3.	Erect.	None.	Little.	None.	Resists.	S. to M.	M	M.	White	Cracks	Tender.	2 to 3	Fine.	Good White
Vitis Champini	" Monticola-Candicans	W. Tex.	H. Jaeger.	V. V.	V. H.	H.	Fairly.	Ea.	May 3.	Erect.	None.	....	None.	Resists.	....	....	....	....	....	....	....	....	
Concord	" Labrusca	Mass.	John Bull.	V. V.	H.	V. H.	Easily.	M.	May 5.	Erect.	None.	Severe.	None.	Resists.	L.	M to L.	M.	Black.	Tender.	Some.	2 to 4 m.	Very good.	Red.
Moore's Early	" Labrusca	Mass.	John B. Moore	V.	H.	V. H.	Easily.	M.	May 5.	E.	None.	Some.	None.	Resists.	M.	V. L.	V. Ea.	Black.	Firm.	Some.	2 to 4 m.	Very good.	Red.
Early Victor	" Labrusca	Kan.	John Burr.	V. V.	H.	V. H.	Easily.	Ea.	May 5.	E.	None.	Severe.	None.	Resists.	M.	S. to M.	Ea.	Black.	Firm.	Tough.	2 to 4 m.	Fine.	Red.
Missouri Riesling	" Rip.-Lab	Mo.	N. Grein.	V. V.	H.	V. H.	Easily.	M.	May 5.	E.	None.	None.	None.	Resists.	M.	M.	Lt.	White	Thin, firm.	Tender.	2 to 3.	Excellent.	White.
Brighton	" Lab-vin	N. Y.	Jacob Moore.	V. V.	H.	H.	Easily.	Ea.	May 5.	Ref.	Little.	Severe.	Little.	Fairly.	Lg.	M.	Ea.	Red.	Thin, firm.	Tender.	2 to 3 s.	Very fine.	White.
Lady	" Labrusca	Ohio.	J. S. Imlay.	W.	H.	H.	Easily.	M.	May 6.	E.	None.	Some.	None.	Resists.	M.	M. to L.	Ea.	White	Tender.	Tender.	1 to 3 m	G'd to v. g'd.	White.
Lindley (R. 9)	" Lab.-vin	Mass.	E. S. Rogers.	V. V.	H.	M.	Easily.	Ea.	May 6.	Ref.	Little.	Some.	Little.	Fairly.	M.	M. to L.	Ea.	Red.	Firm.	Little.	1 to 3 m.	Excellent.	White.
Wilder (R. 4)	" Lab.-vin	Mass.	E. S. Rogers.	V. V.	H.	M.	Easily.	M.	May 6.	Ref.	Little.	Severe.	Little.	Fairly.	M.	V. Lg.	M.	Black.	Firm.	Some.	1 to 3 lg.	Good.	Red.
Pocklington	" Labrusca	N. Y.	J. Pocklington	V. V.	H.	V. H.	Easily.	M.	May 6.	E.	None.	Severe	None.	Well.	M.	V. L.	Lt.	Yel.	Tender.	Tough.	2 to 4	Fair.	White Musky
Martha	" Labrusca	Penn.	Sam'l Miller.	V.	H.	V. H.	Fairly.	M.	May 7.	Erect.	None.	Little.	None	Well.	S. to M.	M.	Ea.	Yel.	Tender.	Tender.	2 to 3 m.	Swt, g'd, foxy	White.
Delaware	" Aest $\frac{1}{2}$-(lab. $\frac{1}{4}$-vin. $\frac{1}{4}$)	N. J.	P. H. Provost.	M.	H.	H.	Poorly.	Ea.	May 7.	E.	None.	None.	Little.	Fairly.	S. to M.	S.	E.	B't red	Firm, thin.	Little.	1 to 3 m.	Best.	White.
Noah	" Rip.-labrusca	Ill.	O Wasserzieher	V. V.	H.	V. H.	Easily.	M.	May 7.	E.	None.	Some.	None.	Resists.	M.	M.	Late.	Yel.	Firm.	Tough.	3 to 4 m.	Good.	Fine White.
Salem (22 or 53)	" Lab.-vin	Mass.	E. S. Rogers.	V.	H.	M.	Easily.	M.	May 7.	E.	None.	Some.	None.	Fairly.	M.	L.	Ea.	Red.	Firm.	Tender.	2 to 3 l.	Fine.	Fine White.
No. 2	" Lab.-vin	Mass.	"	V. V.	H.	M.	Easily.	M.	May 7.	Ref.	None.	Severe.	None.	Fairly.	Lg.	V. L.	Lt.	Black.	Firm.	Tough.	2 to 3 l.	Fair.	Red.
Goethe (1)	" Lab.-vin	Mass.	"	V. V.	H.	M.	Easily.	M.	May 7.	E.	None.	Little.	Little.	Fairly.	M.	V. L.	Lt.	Pink.	Firm.	Tender.	1 to 3 l.	Fine.	White.
No. 32	" Lab.-vin	Mass.	"	V. V.	H.	M.	Easily.	M.	May 7.	Ref.	None.	Much.	None.	Fairly.	M.	L.	M.	Black.	Firm.	Tender.	1 to 3 l.	Good.	Red.
Agawam	" Lab.-vin	Mass.	"	V. V.	H.	M.	Easily.	M.	May 7.	E.	None.	Some.	None.	Fairly.	M.	Lg.	Ea.	Red.	Firm.	Tender.	1 to 3 vl.	Fine.	Amber.
Prentiss	" Lab.-vin	N. Y.	Prentiss.	W.	T.	T.	Easily.	M.	May 7.	E.	None.	Much.	Some.	Poorly.	M.	M.	Ea.	White	Firm.	Tender.	1 to 3 s.	Fine to v. g'd	White
Walter	" (Aest.-lab.-vin.)	N. Y.	A. J. Caywood	V.	H.	H	Poorly.	M.	May 8.	E.	None.	None.	Little.	Resists.	M.	M.	M	B't red	Thin, firm.	Some.	1 to 3 m.	Very fine.	White.
Eumelan	" Aest. $\frac{1}{2}$ (or vin.) Lab. $\frac{1}{2}$	N. Y.	Thorne.	V.	H.	H.	Fairly.	M.	May 8.	Ref.	None.	Some.	Little.	Resists.	Lg.	Lg.	Ea.	Black.	Thin, firm.	Tender.	1 to 3 l.	Fine.	Red.
Merrimac (19)	" Lab.-vin	Mass.	E. S. Rogers.	V. V.	H.	M.	Well.	M.	May 8.	Ref.	None.	Severe.	Little.	Fairly.	M.	V. L.	M.	Black.	Thick.	Tender.	1 to 3 l.	Good.	Red.
Essex (41)	" Lab.-vin	Mass.	"	V. V.	H.	M.	Well.	M.	May 8.	Ref.	None.	Severe.	None.	Fairly.	M.	V. L.	M.	Black.	Thick.	Tough.	1 to 3 vl.	Fair.	Red.
Massasoit (3)	" Lab.-vin	Mass.	"	V. V.	H.	M.	Well.	M.	May 8.	Ref.	None.	Severe.	None.	Fairly.	M.	L.	Ea.	Red.	Thin.	Tender.	1 to 3 m.	Fine.	White.
Irving	" Lab.-vin	N. Y.	S W Underhill	V.	M.	M.	Well.	L.	May 8.	E.	Little.	Severe.	Some.	Fairly.	M.	L.	M.	White	Thin.	Tender.	1 to 3 s.	Fine.	White.
Lady Washington	" Lab.-vin	N. Y.	J. H. Ricketts.	M.	T.	M.	Well.	M.	May 8.	Erect.	Little.	Severe.	Some.	Fairly.	Lg.	M.	M.	Pink.	Tender.	Tender.	1 to 3 s.	Fine.	White.
Holmes	" Aest.-cin.-vin.-lab	S. Tex.	....	V. V.	V. H.	....	Fairly.	Ea.	May 9.	Ref.	None.	Severe.	None.	Resists.	M.	M.	M.	Purple	Thin, firm.	Melting.	2 to 3 s.	Very fine.	White.
Diana	" Lab. $\frac{3}{4}$, Vin. (?) $\frac{1}{4}$	Mass.	Mrs D Crehone	V.	H.	M.	Well.	M.	May 10.	Erect.	Little.	Little.	Little.	Resists.	M.	M.	Lt.	Red.	Thin, firm.	Tough.	2 to 3 m.	Fine.	White.
Triumph	" Lab.-vin	Ohio.	G W Campbell	V.	H.	M.	Well.	M.	May 10.	Erect.	Little.	Little.	Little.	Resists.	V. L.	M. to L.	Lt.	White.	Tender.	Melting.	1 to 3 s.	Excellent.	White.
Peter Wylie	" (L.-V.)-(Aest.-L. V.)	S. C.	Peter Wylie.	W.	M.	T.	Well.	Ea.	May 10.	Erect.	Little.	Severe.	Little.	Fairly.	M.	M.	V. E.	White	Thin, firm.	Tender.	1 to 3 s.	Fine.	White.
Duchess	" Lab.-vin	N. Y.	A. J. Caywood	V.	T.	T.	Well.	M.	May 10.	Erect.	Some.	Severe.	Some.	Fairly.	Lg.	S. to M.	M.	White	Thin, firm.	Tender.	1 to 3 s.	Fine.	White.
White Ann Arbor	" Labrusca	Mich.	C. H. Woodruff	M.	H.	V. H.	Well.	Lt.	May 11.	Erect.	None.	Some.	None.	Well.	M.	M.	E.	White	Tender.	Tender.	1 to 3 m.	Good.	White.
Naomi	" Lab.-vin	N. Y.	J. H. Ricketts.	M.	T.	T.	Well.	Lt.	May 11.	Erect.	None.	Some.	Little.	Fairly.	M.	M.	M.	White	Thin.	Tender.	1 to 3 s.	Fine.	White.
Catawba	" Lab. $\frac{3}{4}$-vin (?) $\frac{1}{4}$	N. C.	J. Adlum.	V.	H.	H.	Well.	Lt.	May 11.	E.	Some.	Severe.	Som	Fairly.	M.	M.	Lt.	Red.	Firm.	Tough.	1 to 3 m.	Fine.	White.
Black Eagle	" Lab.-vin	N. Y.	S W Underhill.	V.	T.	T.	Well.	M.	May 11.	Ref.	Some.	Destr'ys	Some.	Poorly.	Lg.	M. to L.	Ea.	Black.	Firm.	Tender.	1 to 3 m.	Fine.	Red.
Vergennes	" Labrusca (?)	Vt.	W. E. Green.	V.	H.	V. H.	Well.	M.	May 11.	E.	None.	Some.	None.	Well.	M.	M.	M.	Red.	Firm.	Tender.	2 to 4 m.	Good. [ted.	White.
Frost Grape	" Cordifolia	N. Tex.	Wild.	V. V.	V. H.	H.	V poo'y.	Lt.	May 12.	Fm R.	None.	None.	None.	P'fectly	L.	Vy. S.	Latest.	Black.	Thin, firm.	Tender.	1 to 3 m.	Acrid till fros-	Red.
Zinfandel	" Vinifera	Europe.	....	V. V.	H.	T.	Easily.	M.	May 12.	E.	Little.	Severe.	Little.	Fairly.	V. L.	S. to M.	M.	Black.	Thin, firm	Tender.	1 to 3 s.	Fine.	Red.
B. Hamburg	" Vinifera	Europe.	....	V. V.	M.	T.	Easily.	M.	May 12.	E.	Little.	Severe.	Little.	Poorly.	V. L.	V. Lg.	Lt.	Black.	Thin, firm.	Tender.	1 to 3 vl.	Very fine.	White.
"No. 70"	" Rupestris, Aest.-rup, Post-Oak	Sw. Mo.	....	V. V.	V. H.	H.	Well.	Ea.	May 12.	Ref.	None.	None	None.	Resists.	M.	M.	M.	Black.	Thin, firm.	Tender.	1 to 3 m.	Good.	Fine Claret.
White Norton	" (Aest. $\frac{3}{8}$.cin. $\frac{1}{8}$) lab. $\frac{1}{2}$	Mo.	J. Balsiger.	V.	V. H.	H.	Fairly.	M.	May 14.	E.	None.	None.	None.	Resists.	M.	S. to M	Lt.	White.	Thin, firm.	Tough.	1 to 3 s.	Fair.	White.
Excelsior	" Labrusca.vinifera	N. Y.	J. H. Ricketts.	V.	T.	T.	Well.	Lt.	May 15.	E.	None.	Severe.	Severe.	Fairly.	L.	M. to L.	Lt.	Pink.	Thin, firm.	Meaty.	1 to 3 s.	Best	White.
Norton's Va. (Cynthiana)	" Aest.-cin.-lab. (?)	Va.	Lemosq.	V. V.	V. H.	H.	Poorly.	Lt.	May 15.	E.	None.	None.	None.	Resists.	M.	S.	V. Lt.	Black.	Thin, firm.	Firm.	2 to 4 s.	Pure, fine.	Best Claret.
Post Oak grape	" Aest. (Lincecummi)	N. Tex.	....	V. V.	V. H.	....	W'th dit	M.	May 15.	Ref.	None.	None.	None.	Resists.	M.	M.	V. H.	Black.	Thin, firm.	Some.	2 to 4 m.	Fine.	Red.
Neosho	" Aest. (Lincecummi)	Sw. Mo.	H. Jaeger.	V. V.	V. H.	H.	W'th dif	Ea.	May 16.	Ref.	None.	None.	Little.	Resists.	M.	M.	V. Lt.	Black	Thin, firm.	Firm.	2 to 5 s.	Good.	Fine Claret.
Jefferson	" Lab. $\frac{3}{4}$ vin. $\frac{1}{4}$	N. Y.	J. H. Ricketts.	W.	T.	T.	Well.	Lt.	May 16.	E.	None.	Little.	None.	Fairly.	Lg.	M. to L.	Lt.	Pink.	Firm.	Meaty.	1 to 3 s.	Best	White.
Le Noir	" Aest.-cin.-vin	N. C.	....	V. V.	V. H.	T.	Poorly.	Ea.	May 17.	E.	Some.	Severe.	Some.	Resists.	L.	S.	V. L.	Black.	Thin, firm.	Melting.	1 to 3 s.	Fine.	Red.
Summer Grape	" Aest	E. Tenn.	Wild.	V.	V. H.	H.	Hardly.	Lt.	May 17.	Ref.	None.	None.	None.	Resists.	M.	S.	V. Lt.	Black.	Firm.	Firm.	2 to 4 s.	Acid.	Acid.
Cunningham	" Aest.-cin.-vin. (?)	N. C.	....	V. V.	V. H.	T.	Poorly.	Lt.	May 18.	E.	None.	None.	None.	Resists.	M.	S.	Lt.	D'k pr	Thin, firm.	Melting.	1 to 3 s.	Best.	White.
Herbemont	" Aest.-cin.-vin	S. C.	N. Herbemont.	V. V.	V. H.	T.	Poorly.	Lt.	May 19.	E.	None.	Little.	None.	Resists.	V. Lg.	S.	V. Lt.	Purple	Thin, firm.	Melting.	1 to 3 s.	Best.	White.
Warren	" Aest.-cin.-vin. (?)	Ga.	Neil. not Herb	V. V.	V. H.	T.	Poorly.	Lt.	May ...	E.	None.	Little.	None.	Resists.	V. Lg.	S.	V. Lt.	Purple	Thin, firm.	Melting.	1 to 3 s.	Best.	White.
Harwood	" Aest.-cin.-vin	S. Tex.	Maj. Harwood	V. V.	V. H.	T.	V poo'y	Lt.	May 19.	E.	None.	None.	None.	Resists.	V. Lg.	M.	V. Lt.	Purple	Thin, firm.	Melting.	1 to 3 s.	Best.	White.
Ashy or Sweet win'r grape	" Cinerea	N. Tex.	Wild.	V. V.	V. H.	T.	Fairly.	V'l't.	June 1-5	Ref.	None.	None.	None.	p'rfec'ly	V. Lg.	V. S.	Sept Oct.	Pr & bk	Thin, firm.	Melting.	1 to 3 s.	Vinous.	White & Red.
Scuppernong	" Rotundifolia	N. C.	....	V. V.	V. H.	T.	V poo'y	V'l't.	Jun 8-10	Erect.	None.	None.	None.	p'rfec'ly	V. S.	V. L.	V. Lt.	Yel. k	T'ck tough	Pulpy.	1 to 3 vl.	Good.	White.
Muscadine	" Rotundifolia	South.	Native.	V. V.	V. H.	T.	V poo'y	V'l't.	Jun 8-12	Erect.	None.	None.	None.	p'rfec'ly	V. S.	V. L.	Aug. Sept	Black.	T'ck tough	Pulpy.	1 to 3 vl.	Good.	Red.

On motion of H. L. Lyman, a vote of thanks was given Mr. Munson for his valuable paper.

T. S. Hubbard, of New York, read the following notes from John B. Moore, President of the the Massachusetts Horticultural Society, who had been obliged to leave:

Brighton were all killed, where mildewed last year.

Concord—Uninjured.

Duchesse—Most of them entirely destroyed.

Delaware—Those that mildewed last year; tops killed.

Eaton—Uninjured.

Early Victor—Uninjurned; fruit coloring fast.

Francis B. Hayes—Uninjured.

Iona—Tops killed: roots growing strong.

Iron-clad—Worthless.

Jefferson—Killed to the ground: late.

Lady—Hardy and healthy.

Lady Washington—Very much injured; late.

Moore's Early—Uninjured.

Niagara—Planted this year, grows well; mildewed a little.

Prentiss—Tops killed; mildews easily.

Pocklington—Hardy; late in ripening.

Vergennes—Mildews slightly; beginning to color: buds partially injured.

Worden—Uninjured; coloring fast.

Hartford—Uninjured.

Highland—Somewhat injured; too late.

Rogers' Seedlings—All injured, but not killed.

Diana—Injured: not killed.

In the discussion which followed, Prof. Budd called attention to the desirability, for many reasons, of having a resident collector of plants and seeds in Russia. There are no wild grapes in Russia north of the shores of the Black Sea. He had seen raisins from the East for sale at the Russian fairs as good as any from Spain. Though all European grapes are often called vinifera, they differ among themselves as much as the species of America differ. He called attention to deep setting as a preventive of winter killing of the grape roots.

The Chairman, Mr. Barry, then presented the following list of names of grapes for discussion:

Wyoming Red.—H. L. Lyman, Virginia: I have grown it fiveyears. It is of excellent quality, the foliage is good and it ripens its wood well.

Jacob Ganzhorn, Michigan: I have fruited it five or six years. It has borne a good crop every year. It is hardy with me. Its quality is good, but not best. It sells well. Ripens a week before Concord.

C. A. Green, New York: It has handsome clusters resembling Delaware, but deeper red in color. It is of poor quality.

P. Barry, New York: It is of poor quality.

T. S. Hubbard, New York: It is one of the earliest red grapes. It is poor in quality, foxy; still I think most people would call it about as good as Concord. It is valuable for an early red grape. It is a healthy grower, and is being planted in several places in our State in vine yards. At Ann Arbor, Michigan, it was doing well where Concords were rotting.

Geo W. Campbell, Ohio: I have not fruited it very much. It is of a very handsome red color, very foxy, and not of best quality. Its foliage mildewed a little this unfavorable season.

Niagara.—Samuel Hape, Georgia: Its foliage is healthy. I have not fruited it.

W. Phillips, Michigan: Out of forty varieties it is the strongest grower and most abundant bearer I have. Have fruited it six years. By the first of August this year it had grown sixteen feet. It is well adapted to the sandy soil of our Lake Shore.

H. H. Hayes, Michigan: Have fruited it one year. It sells well, ripens well, keeps well; is a good grower, and is not troubled with rot or mildew.

P. M. Augur, Connecticut: C. W. Idell, Commission Merchant, 333 Washington street, New York, thinks it is going to be the popular market grape for New York.

H. L. Lyman, Virginia: It does rot in some seasons.

T. V. Munson, Texas: The rot is the main question with us. Norton's Virginia, Delaware, and Perkins do not rot.

J. B. Rogers, New Jersey: The Niagara as to health is about on a par with Concord.

J. S. Collins, New Jersey: It rots and mildews some; this year it is better. It brings good prices.

P. Barry, New York: We fruited it last year. It is healthy in foliage and fruit. This year it ripens late.

E. Graham, Michigan: Have grown it five years. It is healthy and as hardy as Concord.

T. S. Hubbard, New York: It is a strong grower, very productive and successful in our State, but we don't have much rot and mildew. In some places I am told that it rots as much as Concord. I would not advise planting it where Concord always rots.

Empire State.—P. Barry, New York: I saw the grape before it was out of the hands of the originator. It promises well.

C. A. Green, New York: I saw a vine of it on the Hudson which was healthy and promising.

J. B. Rogers: It is promising in New Jersey.

P. M. Augur, Connecticut: It is a beautiful grower.

Robert Manning, Massachusetts: It grows well.

Geo. W. Campbell, Ohio: Have fruited it this year for the first time. It was not ripe when I left home. From seeing it on exhibition I should think it good in quality and not foxy. It has extremely healthy foliage. Running among other vines that are mildewed, it resists the mildew. It ripens its wood well, and I think is hardy.

Poughkeepsie Red.—Sylvester Johnson, Indiana: It is one of Mr. Caywood's seedlings. It rotted with me some this year, but is an excellent grape.

Ulster Prolific.—P. Barry, New York: It is by the same originator.

Sylvester Johnson, Indiana: It is one of the best grapes I ever grew; is a good grower, but its foliage is not of the best, and it has rotted some. Cannot say as to hardiness.

F. M. Hexamer, New York: I have seen both of these varieties on Mr. Caywood's place, and they are there perfectly healthy and of excellent quality.

Green Ulster.—P. Barry, New York: It is a large red grape with bunches of medium size.

A. J. Caywood, New York: I have known it eighteen years and have never seen a trace of mildew or blight on it. It is a moderate grower and holds its foliage until frost.

B. G. Smith, Massachusetts: I have been familiar with it eleven years. It has been exhibited at the Massachusetts Horticultural Society always receiving honorable mention. It was exhibited before the American Pomological Society in 1879 and 1881. In 1879 the report calls it a "white grape of excellent quality"; in 1881 of "fine quality, and promises to be of much value." It originated with John B. Moore, of Concord, Mass., is of medium size, excellent flavor, early, and perfectly hardy. Ripens a week before Concord. I have seen it growing in Mr. Moore's vineyard by the hundred, with no mildew.

Robert Manning, Massachusetts: I saw tons of them in Mr. Moore's vineyard last week. The vine is not quite so vigorous as Concord. Last year the vines in nursery rows mildewed.

Geo. W. Campbell, Ohio: It grows about as vigorous as Martha. It's foliage is like Concord.

Jessica.—P. Barry, New York: Has any one had experience with this grape, sent out from St. Catherines, Ont?

No one had.

Centennial.—T. S. Hubbard, New York: It originated with Mr. Marvin, of Watertown, and is said to be a small white grape with small clusters.

Geo. W. Campbell, Ohio: I fruited it last season. It has poor foliage and killed to the ground last winter. It is pink when ripe.

W. K. Munson, Michigan: It makes a poor growth.

C. A. Green, New York: A poor grower.

Amber Queen.—T. S. Hubbard, New York: It did well with me the first year, but for the last two years the clusters have been imperfect.

Victoria.—T. S. Hubbard: It is the best of Miner's seedlings—better than the Martha, but most of Miner's I do not think much of. It is large enough.

J. S. Woodward, New York: I obtained a vine for Mr. Miner before he died. It is a large fruit about the size of Concord, ripening a little before it, and of as good quality. Have never seen any sign of rot or mildew.

J. B. Rogers, New Jersey: I think Mr. Woodward must have the Miner instead of Victoria.

T. S. Hubbard, New York: The quality of Victoria is about that of Concord, but it has larger clusters and larger berries.

Triumph—.T. S. Hubbard, New York: It is too late for the North.

T. V. Munson, Texas: We have fruited it nine years. We obtained it from Samuel Miller,

who discovered its good qualities for the South. It has rotted a little this year, but not heretofore. It is large in cluster, medium to large in berry. It is golden in color when fully ripe (green probably in the North), contains but one to three seeds, and melts perfectly in the mouth. It is a vigorous grower, inclined to overbear, and apt to shrivel if it bears too heavily. It is the best of the hybrids I know. Ripens late, about with Catawba. Its quality is fine with me and not insipid as it is said to be at the North.

SAMUEL HAPE, Georgia: It does well in my State; is showy, vigorous and of good quality

Eldorado.—P. M. AUGUR, Connecticut: It rots with me this year.

T. S. HUBBARD, New York: Not worthy of cultivation.

GEO. W. CAMPBELL, Ohio: It has imperfect blossoms, and so sets poorly, mildews and is tender.

Highland.—C. A. UBER, Virginia: It has a fine bunch, but rots.

H. L. LYMAN, Virginia: It is late, vigorous, with large clusters.

P. M. AUGUR, Connecticut: It is too late.

GEO. W. CAMPBELL, Ohio: It is too late, and rots more than any other I have.

Vergennes.—C. A. GREEN, New York: I think well of it. It is a good grower, of fair quality, good foliage, and bunches not very large.

J. B. ROGERS, New Jersey: It is very subject to mildew and rot.

T. S. HUBBARD, New York: I think highly of it. It is healthy except in unfavorable places, inclined to overbear, with good sized berries and medium clusters, good quality, extra good keeper and a good grower.

J. J. HARRISON, Ohio: We never have had any rot or mildew on the lake shore.

C. L. HOAG, New York: It produces an immense quantity of fruit.

H. L. LYMAN, Virginia: It grows well and fruits well in Virginia. Its foliage and wood are good, and ripen well.

P. M. AUGUR, Connecticut: It is a strong grower with us, and very productive. It mildews this year a little. Have kept it until March.

J. S. WOODWARD, New York: It drops badly.

MR. HENDRICKS, New York: It does well on the Hudson.

T. S HUBBARD, New York: It ripens with Concord, and not as early as represented.

P. M. AUGUR, Connecticut: It killed last winter with me.

T. V. MUNSON, Texas: It originated in Vermont with W. E. Green; is vigorous, rots and mildews some; cluster and berry medium, medium in season, red color, skin thin but firm, quality good to best

G. W. CAMPBELL, Ohio: A good grower, berries rather large, good quality, mildewed some this year.

Early Victor.—T. S. HUBBARD, New York: A strong grower, healthy, with medium sized clusters and berries, much better than Concord, ripens a little sooner, has no mildew or rot with us.

C. A. UBER, Virginia: Has no mildew or rot and is earlier than Concord.

J. B. ROGERS, New Jersey: Ripens about with the Concord, better in flavor, perfectly healthy, bunch of good size, and an abundant bearer.

P. M. AUGUR, Connecticut: Have fruited it three years. It ripens a week before Concord.

J. S. COLLINS, New Jersey: It is healthy, a fine bearer and a week before Concord.

GEO. W. CAMPBELL, Ohio: It is healthy. Have seen neither mildew nor rot. It is promising for an early market grape. Ripens a week before Concord, but not as early as Hartford Prolific.

T. V. MUNSON, Texas: Have fruited it two years. In both seasons it rotted severely in what we call the black or first rot. The second or gray rot, that is so destructive to Concord, does not attack it. It ripens with Ives, but has better pulp, is very vigorous and productive, but not profitable on account of rot.

Jefferson.- P. M. AUGUR, Connecticut: Have had it three years; it is tender.

C. A. GREEN, New York: It is two weeks later than Concord.

T. S. HUBBARD, New York: It is as late as Catawba, grows well, has good foliage, and we think quite favorably of it.

J. S. WOODWARD, New York: It is too late.

H. L. LYMAN, Virginia: Have grown it two

years. It requires a good deal of care; will give good fruit with bags and is a valuable late variety.

B. G. SMITH, Massachusetts: I have had good success with it near Boston, but it is tender.

Moore's Early.—J. L. BUDD, Iowa: Few of the grapes mentioned do well in our State, but we obtained some of the first vines of Moore's sent out, and they are very promising. It is hardier than Concord, the reason, I think, being that it has a better leaf. It is a bad season for the foliage this year, and the Concord is much injured, but the Moore is not. The fruit was looking fine when I left home. It is much earlier than Worden, and quite as productive.

H. L. LYMAN, Virginia: We have had it two years. It is satisfactory in wood and foliage, and an abundant bearer. It is ten days earlier than Concord. I shall plant largely of it.

J. C. PLUMB, Wisconsin: I endorse what Prof. Budd has said. It is one of the most promising of the new early grapes for our State. At our State fair this week I examined critically the grapes on exhibition and found Moore's half a week ahead of Worden, and with better clusters.

J. B. ROGER'S, New Jersey: It stands as well as any grape for the market and family.

E. H. SCOTT, Michigan: Have had it three years, and it has done well until this year, when it rots.

JACOB GANZHORN, Michigan: I have had the same experience.

T. V. MUNSON, Texas: It has no anthrax, some rot, and no mildew; it is very early, ripening just after Champion; color black, skin firm, size medium to large; quality good to very good.

J. J. HARRISON, Ohio: It ripens soon after Champion, and does not rot.

C. A. GREEN, New York: It ripens before Worden. We think a great deal of it.

ROBERT MANNING, Massachusetts: I was at Mr. Moore's vineyard the other day and it is doing even better than ever before. On exhibition before the Massachusetts Horticultural Society, Boston, August 29th, it received the first prize as the best early grape. It is hardy and free from mildew; hardier than Concord and ripening two to three weeks before it.

Lady Washington.—P. M. AUGUR, Connecticut: Too late.

C. A. UBER, Virginia: It rots.

SAMUEL HAPE, Georgia: It has succeeded with me this year.

H. L. LYMAN, Virginia: Have fruited it two years successfully. It has shown no rot; the bunches are large and very perfect, and it brings a high price; the foliage is good.

C. A. GREEN, New York: It is too late but otherwise desirable.

T. S. HUBBARD, New York: It is too late; the fruit mildews and the vine becomes feeble after a few years.

Prentiss.—T. T. LYON, Michigan: It is too tender.

E. H. SCOTT, Michigan: Have had it four or five years, and have not had a berry; it kills down.

T. S. HUBBARD, New York: I sent it out, but it does not succeed except in favorable localities.

T. V. MUNSON, Texas: Weak in growth, tender with regard to drought; rots and mildews some, clusters medium, white skin; quality fine; early.

P. M. AUGUR, Connecticut: I had a very fine crop last year. This year it mildews. It is tender.

Worden.—H. L. LYMAN, Virginia: Have fruited it two years. It is a few days later than Moore's, and we prefer the latter—still it is good.

SAMUEL HAPE, Georgia: It does splendidly in our locality.

GEO. W. CAMPBELL, Ohio: It gives satisfaction everywhere I have seen it. It is a little earlier than Concord, probably a seedling from it.

P. M. AUGUR, Connecticut: We have it side by side with Concord, and like it better. It is three or four days earlier.

T. S. HUBBARD, New York: It is looking well at the vineyards of Munson and Knapp, near this city. They think it seven to ten days earlier than Concord. They have contracted their crop of an acre at eight cents, and their Concords at four and a half cents. It seems to be giving good satisfaction. It is earlier than Concord, larger, of better quality and equal to it in health and hardiness.

JACOB GANZHORN, Michigan: Is it less liable to rot?

T. T. LYON, Michigan: Yes. There is no rot in my Wordens and there is in the Concords.

W. K. MUNSON, Michigan: I have had it ten

years. It is from eight to fifteen days earlier than Concord, a stronger grower, with larger and thicker leaves. It is as good a bearer and as hardy. It is the best black grape we have. My vineyard is a sandy loam with clay subsoil. There is no rot on any of my vines.

J. L. BUDD, Iowa: I commenced growing it eighteen years ago, and talked about it and tried to get Western men to grow it, but people at the East discouraged it: they called it the same as Concord, so that until within five or six years we have not grown it much at the West. But unless we except Moore's it is the best black grape we have at the West. It seems to have everything in its favor. It ripens seven to ten days before Concord.

J. S. WOODWARD, New York: It is not as good quality as Concord. We are liable to make a mistake in comparing their quality, because at the time of comparison the Worden is apt to be ripest. It is more foxy than Concord and not as rich and sweet.

On motion a committee consisting of T. V. Munson of Texas, P. M. Augur of Connecticut, and C. A. Uber of Virginia, were appointed by the Chair to visit the vineyards of Messrs. Munson and Knapp, near the city, and report at the afternoon session upon the comparative merits of the Worden and other grapes they grow.

About fifty gentlemen visited, upon invitation, the vineyards mentioned and a report was made toward the close of the afternoon session.

Duchesse.—C. A. GREEN, New York: It is one of the finest, but tender. It has large clusters of fine quality.

T. T. LYON, Michigan: The vine fails in many locations.

H. L. LYMAN, Virginia: It requires careful pruning to ripen its wood with us. It is subject to rot.

Pocklington.—E. H. SCOTT AND PETER COLLER, Michigan: It rots.

T. V. MUNSON, Texas: It is vigorous and hardy South: is subject to rot, but not mildew; clusters medium to large, yellow, skin tender, pulp tough, quality fair, but musky.

MR. CAYWOOD, New York: It drops quite badly, and is of poor quality.

C. A. UBER, Virginia: Vigorous, but rots.

Woodruff Red.—T. T. LYON, Michigan: It was shown at the Boston meeting four years ago. It is not yet ripe. I think it a valuable market variety, both on account of the vine and fruit. It is of fair quality.

E. H. SCOTT, Michigan: It does well in our locality, and though it is being widely tried I have received no reports against it as regards foliage or vigor of growth. I have not known it to mildew. It is as good as Concord, and ripens about with it, or two or three days earlier.

C. A. GREEN, New York: It succeeds almost anywhere. It has a large bunch and berry, and is very attractive.

JACOB GANZHORN, Michigan: Have fruited it four years, and had a good crop every year. It is perfectly hardy, as productive as Concord, ripens about with it, and does not rot.

T. S. HUBBARD, New York: It is a strong grower, and looks like the New England Fox grape in foliage and growth of vine. The canes have little prickers.

J. S. WOODWARD, New York: It grows healthy and strong. As I saw it at Ann Arbor, Michigan, it was of fine appearance and fair quality; more pulpy than Concord. I think it will make a good market grape.

Eaton.—B. G. SMITH, Massachusetts: It has been exhibited several times at the Massachustts Horticultural Society and seems promising. It is not generally disseminated yet. It has also been exhibited before this society. The bunches are large and the berries sometimes an inch in diameter.

ROBERT MANNING, Massachusetts: It is an excellent black grape—large, showy and of good quality, equal to Concord.

REPORT ON NATIVE FRUITS.

The Committee on Native Fruits made the following report on varieties exhibited at this meeting:

APPLES.

Seedling, by J. S. Woodward. Supposed to be from seed of the Yellow Bellflower, strongly resembles the Porter in appearance and quality.

Seedling, from H. S. Strickland, Stevensville, Michigan. Medium size, crimson, striped, sweet Late September, said to be a marvel of productiveness. A promising variety.

Seedling, from G. Richards, Glenn, Michigan. Large, flat, striped and blotched with bright

crimson; rather sharp acid. Ripe at the time of testing.

Seedling, from A. Walker, St. Joseph, Michigan. Medium size, conical. Not in season; may prove desirable for market and cooking.

PEARS.

Seedling, from three miles north of Richmond, Indiana. Below medium size, greenish yellow; juicy and melting; quality "very good." Not large or attractive enough for market.

Comet—Specimens grown by A. J. Caywood, Marlborough, N. Y. Medium size, obovate pyriform; ground color yellow; in the sun, striped and blushed with brilliant carmine; very showy. Texture breaking; quality scarcely "good." The specimens had been kept in cold storage for about five weeks. The committee speak of it by the name under which it was presented, without undertaking to determine what name is correct.

PEACHES.

Ingraham—Named for the originator. Presented by Joseph J. Robinson, Lamont, Ottawa County, Michigan. Full medium size; dull greenish white, slightly spotted and blotched with red; freestone. Quality good, though a little past its season.

Lewis—A seedling from Allegan County, Michigan. It bears the name of the originator. Full medium size; roundish, a little irregular; suture slight, but distinct; color creamy white, streaked and dotted with two shades of red; freestone. Quality "very good." Season, immediately following Hale's Early.

PLUM.

Kroh—Originated by P. H. Kroh, Anna, Illinois. Small, oval, dull purplish red, considerably specked with gray, and having a thin bloom; wanting in character, but quite past its season. From seed of either *Prunus Chicasa* or *P. Americana*.

GRAPES.

Empire State—Presented by Pratt Brothers, Rochester, N. Y. Bunch of medium size, long, compact, frequently shouldered. Berry not above medium size, round, pale green with a whitish bloom. Vinous, with a Muscat flavor. Not fully ripe, but gave promise of excellent quality when ripe. From seed of Hartford, fertilized with Clinton.

Black Delaware—From A. J. Caywood, Marlborough, N. Y. Bunch above medium size, long, shouldered. Berry of full medium size, black, with a dense whitish bloom. Spirited and vinous, but would probably be considerably milder when fully ripe. From seed of the Concord, fertilized by the Delaware, but shows no signs of the influence of the male parent.

Woodruff Red—Bunch large, compact, irregular. Berry large, round. Some of the berries were just beginning to color, but were too unripe for the committee to speak further of it.

GOOSEBERRY.

Randolph—Originated in the garden of Dr. C. P. Baender, Moberly, Randolph County, Missouri. The specimens were preserved in alcohol, and the committee could only judge of the size, which is very large. The originator claims it to be a seedling from the American species.

Many of the fruits submitted to the judgment of the committee were either past their season or unripe, and the committee suggest that the growers send specimens to the chairman at the time of their maturity, when a better estimate of their value can be formed.

T. T. Lyon, Michigan.
Franklin Davis, Marlyand.
Robert Manning, Massachusetts.

On motion of Mr. Lyon, the question of the name of the "Comet" pear was referred to the Committee on Nomenclature.

FRIDAY—AFTERNOON SESSION.

Geo. W. Campbell, of Ohio, in the Chair. The first paper of the afternoon was entitled:

NEEDS AND METHODS OF GATHERING FRUIT STATISTICS.

By W. I. Chamberlain, of Ohio.

I am not, technically speaking, a pomological expert, though I own a good sized commercial apple orchard, planted and pruned by my own hands, and have raised as a farmer an abundance of pears, grapes and small fruits for home use. Still I am not, in pomology at least, what our friends of the daily press so felicitously denominate "a scientific sharp," meaning thereby one who has taken some single department or subdivision of science and pursued it year after year with unceasing zest and unremitting energy until he has come to know more of it than of all things else on earth, and more than all men else on earth but him know of it. Such men are the benefactors of the race. Indeed, when we think how short life is, we may almost say they are the only ones that really and materially advance science. As the old verses have it:

> If one could but be sure
> That his days would endure
> As of old for a thousand long years,

one might hope to cover the whole range of human knowledge. Indeed a hundred years ago when that range was almost infinitely smaller, some single men of great acuteness of mind and power of memory did claim to have grasped it all, essentially. (Whewell.) But in these days the specialists in science are the only ones, as I have intimated, to whom we can look to advance science, and the arts that rest upon and are promoted by science. (Cook, Arthur, Bessey, etc.)

If I am a specialist at all it is as a prognosticator of the crops. Formerly the statistics of the several crops, fruits and live stock were taken by State authority a full year after the crops were harvested and sold, the swine and beeves butchered and packed, and all interest in them was gone. Such statistics have a historic and corrective and comparative value, just as the census figures have, which are taken once in ten years and published in full after much red tape and the lapse of two or three years from the year they were taken. But so far as concerns giving the producer any aid in judging how to sell his crops, they are like a telescope after the eclipse is past; like medicine after the post mortem is over; like a mid-wife after the child is born, or like the statistics of the grain found in the wrappings of the Egyptian mummy. Further than that, the figures of the census, at least of crops, and the arguments and estimates based thereon, are often wholly misleading from the great annual variations in the crops. For example, in 1880 and 1882 Illinois yielded (each year) about 52½ million bushels of merchantable wheat. This year that State yields only one-tenth of that amount. Suppose, now, the big crop had occurred and been reported in the census of 1870, and the small crop in the census of 1880, and some wise statistician had argued therefrom alarming soil exhaustion and famine for the future. The argument would be scarcely less fallacious than many that have been sagely deduced from the census. It is clear that so far as crops are concerned, the census to be of real value must be far more frequent and, if necessary, far less minute, and that even then it must be supplemented by monthly reports of condition, with prognostications and final estimates of the outcome. This latter work is already done in many of the States by the Secretary of the State Board of Agriculture or the Secretary of State, and done exceedingly well so far as farm crops and products proper are concerned. I need not, therefore, in this presence argue at any length to show the importance and value, the need of prompt and reliable crop and fruit statistics. It is now pretty generally conceded that an accurate knowledge of the present condition of the crops, month by month, is the only legitimate basis of prices and of trade, and that the agricultural and horticultural departments of State and Nation are bound to furnish such in-

formation to the people month by month, in the interests of business and of commerce; and see to it that it is prompt, accurate, impartial and thoroughly trustworthy. Heavy buyers, dealers and speculators obtain this information more or less accurately for themselves, and at great expense. If the multitude of small producers, and still smaller consumers, are to have similar information in the interests of justice, truth and fair and equitable prices, then State or National agencies must furnish it. And, as I have said, the boards of agriculture in many of our States are doing this work fairly well so far as the agricultural products proper are concerned. You will agree with me, too, in what I said some time since before another audience, that it is promotive not only of our agricultural interests, but of the general interests of business, that both producer and consumer should have this information as the basis of an equitable adjustment of prices. For if the heavy speculators alone know the real condition of crops, they can "beat" the market until the crop is bought at too low a figure for the facts, and so defraud the producers, and then "bull" the market till they have unloaded at too high a figure for the facts, and thus defraud consumers. And it is plain that the interests of agriculture are best promoted and future production is most increased, when the farmers really get the fair price for their products, and the dealers simply get a fair compensation for the risk and cost and skill of handling the product. For example, if the hundred million bushels of wheat, more or less, produced annually by the two States of Illinois and Ohio, are sold at $1 per bushel, when the real facts and the tendency of prices justify $1.25, then the 25 cents per bushel, or $25,000,000, goes into the hands of the speculators to enrich them, and to be expended largely in the cities on more luxuries that shall in no way increase the fixed or productive capital of agriculture. But if the farmers get this $25,000,000 it goes largely into better buildigns, improvements, stock, fertilizers, education for their children, comfort in their homes and the like, that shall assuredly increase the total future products of the soil. In short, this $25,000,000 is then turned into real productive capital—into agricultural prosperity and intelligence, that shall also increase our business prosperity of the land for years to come.

The importance of this redistribution of wealth to the country at large cannot be over-estimated. The history of the ages and the cities of the past enforces it. While Italy was tilled by educated freemen she was truly prosperous; when her freemen were drawn to Rome and into her conquering armies, and her soil and cultivation were given over to the hands of ignorant freemen and slaves, her doom was sealed. Her soil was robbed of its fertility, the granaries of Sicily were tapped and exhausted, and Northern Africa and all Europe were ravaged by her conquering armies for food supplies for themselves and for luxurous Rome, and for the depleted and exhausted fields and people of Italy. To frustrate and prevent in our own country this tendency of wealth to mass in cities and exhaust the soil and degrade the country population in comfort and intelligence, greater intelligence is demanded among agriculturists and horticulturists largely in two lines. First, better knowledge of the soil and of the crops, fruits and animals that are fed from it, with the means of increasing the fertility of the soil, and the quantity and quality of the products that spring from it. Second, and scarcely less important, a better knowledge on the part of farmers and fruit growers of the best time and place to market their products, and the best means of obtaining a full distribution from points of local over-abundance and glut and supply to points of local scarcity, and the equalization of prices and adequate returns to the producer that naturally result therefrom. That these two problems are co-ordinate and almost equally important to the producer is not hard to see. For what avails it to the farmer or gardener, financially and socially that he "makes two spears of grass or two apples grow where only one grew before," if he gets no more cash or comfort in his home for the two than he would for the one? And yet hitherto the discussions and essays in our agricultural and horticultural periodicals and meetings have been directed almost wholly to the former of these problems. I make no apology therefore for presenting for your consideration the only paper of this occasion on the second problem, the problem of ascertaining in advance, month by month, accurately the condition of the various crops of the land and the local abundance or shortage, and the probable total of each, in order to secure a prompt and proper distribution

of all, a fair basis of prices, and a just return to the local producers.

The speaker here gave a full, interesting and detailed statement of the methods adopted by the Ohio State Board of Agriculture, of which he is Secretary, for securing such information in Ohio, and declared that it was most effective in regard to horticultural and, especially, pomological products. Also that there is, if possible, greater need here than in agricultural products, from the greater variation in local and annual fruit crops than cereal crops, and from their more perishable character and the consequent necessity of quicker handling and marketing; and appealed to all local, State and National horticultural and pomological societies to aid State boards of agriculture and the National Department of Agriculture in obtaining and promptly disseminating such information.

The subject following was

PACKING AND SHIPMENT OF FRUITS.

By Parker Earle, of Illinois.

Mr. Earle said: I have not had time to prepare a paper, but will talk a little upon this very practical subject. In commercial fruit-growing the preparation of the fruit for market and the transportation of it is a matter of importance second to no other. The success that may attend the marketing of fruits, if the best packages are used and the best transportation secured, will depend on the quality of the fruits produced; so that any discussion that would be of value would involve first, the proper growth of our fruits. If we grow poor fruit, it makes little difference how we put it on the market. But presuming that the fruits we have grown are worthy in growth and variety, and properly ripened, the question then of how shall we handle them is certainly one of great importance. The fruit-grower who lives near his consuming market, and I think by the way, he is about the most hopefully placed of any fruit-grower anywhere, is quite independent in this matter. It doesn't make so much difference to him what kind of packages he uses, so long as he pleases his customers, because he has but a short distance to go and his fruit will carry well anyway. But there is a very large fruit production in America intended for very distant markets, and this business has been growing rapidly for the last twenty or twenty-five years—especially during the last fifteen years—until we see the most tender fruits, beginning with strawberries, grown in Florida and other Gulf States intended for the markets of the parallel of 40° to 50°; and they are sent to these markets to a certain extent successfully. Florida strawberries are seen in the northern cities in February, and are sent west from New York to Chicago, and some of them are sent almost a thousand miles beyond Chicago. I have known strawberries to be held in the market on South Water street four or five days in good condition. They stood so well because they had never been heated, but had been constantly kept in a cool temperature—though with actual refrigeration only from Florida to New York. Thus in cool weather, even strawberries so delicate and tender that in hot weather you can scarcely keep them overnight or send them across Lake Michigan, may be kept for days and even weeks.

Every day through the summer car-loads of fruits arrive in Chicago from California,—often eight or ten in a day, and they mainly reach the consuming markets in very good condition—largely in the very best of condition. These fruits are not pears alone, which are somewhat durable, but they begin with cherries, apricots, nectarines and peaches, and go on through the season to pears, grapes and other fruits. It was most surprising to me to see Hale's early peaches in New York and Boston, grown in California, and yet in good condition. As we grow them in Southern Illinois we have great difficulty in most cases in getting them to Chicago without serious loss by decay. What is the reason of this difference? First, the California peaches are well grown, in a congenial soil and suitable climate, which is very dry, and I think very free from the germs of decay. Again, they have no curculios there, and I believe they will always be without them, hence, the fruit is sound when it is packed. The peaches are picked when fully grown or nearly so, gathered very carefully, and wrapped in paper. They are placed in shallow packages and handled with great care, being handled by men who ship them so that until they get into the hands of the express companies this side of Chicago they are handled with the utmost care. So even Hale's and Alexander peaches are shipped everywhere with notable success. This all indicates to me that we of the East are

not all doing as well as we might in the shipment of our fruits. We are not reaching markets as far away, or with our fruit in as good condition as we should; and are not making this business as profitable to ourselves as we ought. Very much of all success in distant marketing depends upon packages and upon methods of transportation. Take strawberries for example. It has always seemed to me that the very worst package for strawberries for shipping to a considerable distance is the one used so largely in Southern Ohio, the half bushel drawer. This is an almost immemorial package. It has been in use from the infancy of strawberry culture in Ohio until this time. I have seen it year after year in Detroit and other northern cities, and it always succeeds in delivering the berries in a damaged condition. The finest berries being often crushed by the huge packages, too heavy for one man to lift, being rolled over and over. The only package that strawberries or blackberries should ever be packed in is the quart box or basket. Eastern growers use a quart basket in an open crate, and possibly it is better than the western box. Still ours is a very good package if we ship in cool weather or in refrigerator cars. I use a quart box, but not the Michigan quart box, which holds the right amount, but does not look as large nor carry the berries so well as the broader and more shallow one which I use. The sixteen quart crate used in Michigan is about as high as wide, so it is difficult to tell whether it is on its side or bottom. The box made in Southern Illinois is five inches square and two and a half deep inside, and is packed twenty-four in a crate, making a broad shallow crate, a package which you readily and always know how to set down, and can readily see whether it is right side up. The long octagon box used in Tennessee is inferior to this. Raspberries should always be shipped in pints. Any raspberry that will carry in a quart box is too hard, and too poor, and should never be grown. I believe the best raspberry package I have ever seen is 1¼ inches deep, and five inches square. I have no difficulty in shipping red raspberries long distances by using this box (I grow Turner most largely). I have shipped them 600 miles and had them arrive in fair condition. They were sent in refrigerator cars to Chicago by freight, requiring two days, and then reshipped to their destination by express.

Now as to larger fruits: I suppose there was never invented a package so well designed to destroy peaches, as the bushel crates of Delaware and Maryland, consisting of three pieces of heading surrounded by lath, and into which the peaches are dumped from baskets as they are picked. Next to that in badness I think is the Delaware peach basket which is about 13 or 14 inches deep. The same in diameter at the top, and ten inches at the bottom, and which holds 18 or 20 quarts. This is entirely too large for shipping ripe peaches. I have seen excellent peaches in your market here in bushel baskets, and this seems to do well for a near market, but for a distant market it must be a poor package. The Michigan peach basket is better than that of Delaware. You people in Michigan seem to have mastered the art of producing very small sized baskets. But much as I admire their small capacity, I do not like their form. They are too deep for the quantity held. I believe the basket is a good kind of a package for peaches, providing it is shallow enough. That of Delaware is too deep and too big; that of Michigan is too deep and too small. I use an oblong flat basket, the Michigan grape basket, about 15x8x5 inches, and holding about one-quarter bushel when well filled. This is used both for a near and distant market. It is furnished with handles and will carry fine ripe peaches in good order. There are dealers in Chicago who buy Delaware peaches and repack them in these baskets to send farther west. Not long since I received a circular and a letter from a gentleman in Baltimore about a new kind of package for peaches and other fruits, called the "Ripe Fruit Carrier," and some time after (a week ago to-day) I received a package at Cobden, Illinois, full of peaches. The package is a crate about 1x2 feet in which are packed a series of pasteboard cells, each cell large enough to hold a peach of a certain size. They were received at Cobden three days from picking, in a ripe and eatable condition. This was on Friday, and on next Monday I started for Grand Rapids to attend this meeting. I took three of the firmest of the lot and placed them in a pasteboard box and brought them here, and they are now as you see, still in very good condition, eleven days from picking. It would be better, I think, if each peach were wrapped in paper or cotton. I think with some such package as

this, peaches could be shipped from Michigan to England if it were desired. The package holds two hundred peaches, one hundred in each end, and is the ordinary "egg carriers," ventilated and adapted to the size of fruits. It is a patented article, the patent being on the ventilation of the cells.

In the matter of transportation it is desirable to keep the fruit as far as possible out of the hands of the express companies, not altogether because of the cost, but largely because of the rough manner in which expressmen handle fruit packages, and the hot and unventilated cars in which they carry our fruits. I have shipped much fruit long distances, and have reached almost all the markets east of the Rocky Mountains at one time or another, and the result of it all is that I do not ship anything by express when I can help it.

Now in shipping by freight the difficulty is time, and perhaps in the class of cars. Now we have in Illinois an accomodating and wisely managed railroad, the Illinois Central. They have for many years furnished excellent shipping facilities—cars with good springs and double walls to resist heat, and well ventilated. They run them on excellent time and for reasonable pay. Whatever success has attended fruit growing in Southern Illinois has been largely due to the wisdom and accommodating spirit of the Illinois Central Railroad Company. But with all these advantages, we still find great difficulty in making any of our fruits keep well in very hot weather. The most essential condition in keeping fruits is to have them cool, say at 50° to 55°. I have been for about twenty years experimenting in the use of refrigerator boxes and cars. For many years I have shipped strawberries in refrigerator cars. It is a better way to ship berries and many other fruits than to use any of the ventilated cars, where you want to reach a distant market. My success has been uniform. I have never had one failure where fruit was sound at starting. I have never had a case of strawberries taken out in bad condition unless it went in so. I can ship berries 600 miles and have them arrive in as good condition as when they started. Where fruit is largely grown a combination can be made among the growers by which this method can be used, or one can buy the fruit of the others and ship it. I have been at this a good while, but no one need to fail if he will use moderate judgment. Do not have the car too cold, but be sure and get the fruit entirely cooled. I believe the Tiffany car the only one suitably made for this purpose, and it seems to me to be about absolutely perfect in its adaptation to this kind of service.

In a short discussion on the topic, Mr. Hubbard mentioned a gift crate or basket for grapes, twice the size of a strawberry basket, in use on the Hudson.

A paper on the same subject was received from Chas. E. Brown, of Nova Scotia:

"The great practical question is, how can we cultivate fruit in such a manner as to produce the largest degree of profit from the transaction? We raise a variety in this Province called the Nonpareil. I understand from good authority that it is cultivated more successfully in the County of Annapolis than in the County of Kings, but I imagine it is only a question of soil, and it would not be difficult for Kings County to raise this kind of apple in the course of time. From my standpoint the Nonpareil is not a very delicious or a very desirable apple in any form, yet there is one quality of importance. Raised in the County of Annapolis it can go to the London market and the great centers of the world at the latter end of May, and even later, in a perfect condition. Is there any other belt in the world that can send an apple to compete with it? This is a question which the fruit growers of this valley should put to themselves. Because, if not, they may lay it down as an axiomatic fact that the teeming millions of this earth are bound to have apples at all seasons of the year, and are bound to pay for them. I have been informed by a gentlemen in Nova Scotia who was in London and Paris last season, that he saw Nonpareil apples, raised in Nova Scotia, sold in London at prices ranging from two pounds to two pounds ten shillings sterling per barrel, and no competition whatever to meet. He traced these same apples farther; he went to Paris and found there the Nonpareil, alone with no competition, sold at ten cents apiece. I have made an estimate in my mind of how many apples a barrel of Nonpareils would contain. The Nonpareil being a small and closely packed apple, I think 600 to the barrel would not be a large estimate for Nonpareils of average size. Now, if there

are 600 in a barrel of Nonpareils, which are sold at ten cents apiece, it would amount to $60.00 per barrel Bearing this fact in mind, I want to know why it is that we are devoting our time and energy in this valley to the cultivation of apples in which the whole world can compete with us, when we have it in our power to raise an apple with which we can defy competition, and with which we alone can supply the demands of the millions in the great markets of the world in certain seasons of the year. They can grow the Nonpareil apple in England, in the United States and in Ontario, but the Nonpareil apples grown in England, the United States and Ontario are worthless after the last days of April are past—worthless, as a rule, after the last days of March; but here in this favored vale we raise an apple that when the productions of other countries have ceased to have a commercial value, has reached the point in which it is entirely King in the markets of the world.

Upon invitation the following address was given upon

GROWING HARDY FRUITS.

By Peter M. Gideon, of Minnesota.

I have been honored with an invitation to give you a brief history of my trials, failures, and final success in propagating new and hardy varieties of apples from seed. Before proceeding I would ask to be allowed to trespass upon your time for a few moments and give a brief retrospect of my life.

I was born and raised in Champaign County, Ohio. At an early date in life I planted peach seeds; when they were a year old I transplanted them with my own hands, cultivated and got fruit from them before I was nine years old. My father then sold the old homestead and bought a farm on which there was no fruit, but at the age of eleven years I planted apples, peaches, cherries and currants, of which we soon had a profusion.

At the age of twenty-one years I emigrated to DeWitt County, Illinois, and there soon had a fine orchard, which in time I sold, and emigrated to Minnesota thirty-two years ago, and began again in full faith and determination to grow fruit. The first year I set out 500 trees, including apple, pear, plum, cherry and quince, and planted one bushel of apple and a peck of peach seeds. For eleven years I made annual additions to the orchard, and planted of Southern and Eastern apple seed enough to grow a thousand trees each year. All kept as long as they could be made to live in Minnesota, and to day only one—the Wealthy—is alive, and it is badly demoralized from the extreme cold of last winter, but will recover and be a tree again.

At the end of the first ten years a hard winter was upon us; trees soon showed death had done its work, and with it all hope of apple culture in Minnesota was gone. I at once resolved to leave the State, and so informed the family, at which they all rejoiced. I went to bed after coming to this decision, and was impressed to try once again, and wrote to Maine for seeds and cions. The result was, after a little correspondence, I spent what little money I had in getting this Maine stock, and denied myself the suit of clothes I needed sorely to start again on the trial for fruit that would stand the climate of Minnesota.

From the cions I got of Albert Emerson of Maine, I grew the Oldenburg, Blue Pearmain and Cherry Crab, and from the seeds the Wealthy. I named the last in honor of my wife. These four varieties, including a seedling crab got from one Alexander Buchanan, who brought the seed from Boston, constituted the foundation of Minnesota apple culture.

Since the first twelve years we have grown only from our own growing of seed, with results fully up to our most sanguine anticipations. The Oldenburg, Wealthy and Cherry Crab grew close together; the Seedling Crab far away, surrounded by Blue Pearmains, the results being quite similar—neither exactly duplicated itself. Apples of all sizes, forms, colors and flavors from each, yet seldom varying in season of ripening over a month from that of the parent apple from which the seeds were taken. A large percentage of the seedlings prove tender, the best stand as to hardiness being from Cherry Crab seed, and none so small in fruit, and none so large, as each of the others gave, but in quality about an average.

Perhaps I would not be far from the truth to say about one to each 500 seedlings, with good care in selecting seed, will produce a fair-sized, first-class apple, as hardy in tree as the Wealthy or Oldenburg; but each of our extra hardy sorts

that stood well the last winter, stand about as one to each 1,500 seedlings.

There is no variety, without Siberian Crab in it, that can stand our greatest extremes of climate, hence the necessity of a cross, and to get the hardiness of the crab in the tree with fruit of first quality, is not a result that comes every time. For bear in mind the fact that the best we have to operate with are a mass of mongrels, of perhaps a thousand degrees of crossing. Our process is to cross mongrel with mongrel, and at each repetition select the best and try again. We use no hand manipulation, but plant close together, and thus give nature a chance to distribute pollen freely and successfully on all bloom.

Certainly all the manipulators of the nation cannot show as many good varieties of apple as we can, to say nothing about the hardiness of trees. No manipulator has as yet produced his ideal fruit, nor cannot, for the good reason that all our fruits of every class are a mass of mongrels, the progeny of which no known law in nature can govern.

Next upon the programme was a paper presented upon

FRUIT TREES FOR THE NORTHWEST.

By J. L. Budd, Ames, Iowa.

North of the 42d parallel and west of Lake Michigan to the Rocky Mountain slopes, is a rich undulating plain large enough to take in several of the Kingdoms of South Western Europe.

The tens of thousands of homestead owners on this great prairie tract, are justly proud of the agricultural possibilities of their soil, and they have found it easy to start quick growing shelter belts and groves. But aside from the crabs, the the Oldenburg and Tetofsky apple, and selected sorts of the native plum; they have had over large areas of this tract a discouraging experience in trying to grow a home supply of the orchard fruits. A few varieties, such as Wealthy, Plumb's Cider, Walbridge, Pewaukee, etc., have been recommended and widely planted, but our recent test winters have killed or seriously injured all trees of bearing size except those on favorable soils near the southern borders of this belt.

Over this true northwest scope the decision of experienced settlers is now quite general that only varieties of the apple as hardy as the Oldenburg, Tetofsky, Whitney's, No. 20, and the crabs, can be relied on for long lived and profitable orchards.

Very many at the north have believed, with Mr. Peter Gideon, that crab hybrids would soon be developed combining the requisite hardiness of tree with a desirable size and quality of fruit for all seasons.

Others have believed that the varieties of the apple, pear, cherry, and plum from the home of the Oldenburg in Northeastern Europe—or ultimately their seedlings—would most speedily and perfectly meet our wants and wishes.

The little comparative advance as yet made in the improvement of the crab, and its fatal tendency to blight, has of late rapidly lessened the number of believers in this line of advancement. The supposed origin of Whitney's No. 20 and the Wealthy from crab seed has supported the popular belief in crab hybrids, but close observers fail to discover in leaf, bud, habit of growth, or fruit, a single trace of crab origin. The parentage of these and of every seedling variety of desired size and quality yet originated in the cold North and West can be traced by unmistakable characteristics to the Oldenburg, Tetofsky, Alexander and Famense.

The continued good behavior of tree of the few sorts first introduced as strays from Northeastern Europe—with the apparently equal hardiness of tree and unexpected size, quality, and varied season of a few recently introduced varieties, now in bearing—have of late created a demand for Russian trees far exceeding present supply. But as yet we know very little of the relative value, or even the season of the many varieties of Russian fruits now on trial. The great list imported by the Department of Agriculture in 1869 has been sifted very slowly. The climate of Washington was very unfavorable for testing the relative value of northern fruits, and the little packets of scions sent out for trial by the Department contained far more blanks than prizes. If used in whole or in part by our busy propagators the mixed lot of North German, Baltic, and "simon pure" Russian varieties, was top worked on crabs, or put in with other root grafts in nursery. When the time came for clearing the nursery row the many failures in the Russian

row obscured the few successes, and all went to the brush heap together.

The writer, with many others at the West, received these packages when we supposed that even the Ben Davis would make a long lived and profitable sort. Hence the trial row of Russians did not long encumber the ground.

The first favorable stories of the good behavior of some of the Department varieties under great climatic difficulties came from a few men in the cold north who *re-worked* some of the varieties left in the neglected nursery row after the test winter of 1872 3.

The most successful sifter of the cumbersome list has been Mr. A. G. Tuttle, of Baraboo, Wisconsin. He has sifted, and resifted, without regard to the ridicule of brother fruit growers, who believed in the old list, and now he can show an orchard which stands like an oasis among the broken or ruined orchards of his parallel.

But farther investigation has shown that the first importations of scions contained very few of the later keeping and really better varieties of the parts of Eastern Russia, where dent corn, melons, and tomatoes can be perfectly ripened.

We have now on trial—at very many stations north and south of the 42d parallel—many varieties of the apple, pear, cherry and plum of the interior sections of Northeast Europe, and we have at this time the fruit of over fifty varieties of the apple from trees that seem as hardy as the Oldenburg, which would not discredit an Eastern exhibition table. While the collection has several varieties earlier than Early Harvest, and a number of excellent summer and fall sorts, both sweet and sour, it also contains a dozen or more early winter sorts of really fine size, appearance and quality. Farther north, these varieties will keep through winter, as they are all later with us than Wealthy. But this does not exhaust our trial list, as many of the winter varieties gathered three years ago in the black soil region of Central Russia and North Silesia have not yet fruited with us. Among these we expect to find a number of fine winter apples for North Iowa and Southern Minnesota, and a number of kinds from Kiev, Koursk, Orel, etc., which will prove keepers on the 42d parallel, where the Wealthy is only an early fall fruit.

South of the latter parallel and north of Missouri we expect some of the Silesian and Transylvanian varieties of late keepers to do well as root grafts on the black prairie soils, and many of the old recommended list which have recently failed as root grafts will prove hardy and durable when top worked on stocks as hardy as Gros Pomier.

Our whole country is yet new. Evidently it will take time to determine the varieties of the orchard fruits which will succeed best on our varied soils, altitudes and latitudes of the great section known as the Northwest. As instances, the Anis apple is a medium sized autumn apple here of no great value. In North Dakota, where it should be equally hardy, it is a late winter sort of almost priceless value. Again, the Vladimir cherry is the least successful variety we have at this point from Northeast Europe, as its foliage does not stand well our intense summer heat. At the far north its foliage is perfect and it should prove a boon to the country.

The question of proper distribution should be the work of many trial stations.

I will only add the following general conclusions, founded on observations at our home station, at Ames, and at many points over the Northwest:

1. The varieties of the apple and pear indigenous to Western Russia, within three hundred miles of the Baltic, are more inclined to blight than those of the far interior where the summers are drier and hotter.

2. We find the quality of fruit of the interior varieties much higher than those from the cooler and moister coast sections.

3. We find a much larger per cent of keeping varieties of the apple among those from the black soil region of the far interior.

4. The cherries and plums from the East plain we find hardy in tree and more perfect in foliage than the varieties we have hitherto tried.

5. The nomenclature of fruits in Russia has been much confused, but the leading pomologists who have gathered scions for the use of the Iowa Agricultural College have made great advances since the time when Dr. Regel forwarded scions to the Department of Agriculture. As a rule our late importations through Dr. Regel, C. H. Wagner, Mr. Goeggeler, Dr. Fischer, Count Bogdanoff and others, we believe will furnish true guides in correcting faulty nomenclature.

But many of the varieties we have received from Dr. Shraeder, of Moscow, and from the nurseries at Vilne, believe will not prove true to name. As instances, the cherry received from Vilne as Brusseler Braune proves to be a variety of the Heart cherries of the East; and two varieties of apple from Dr. Shraeder which he marked summer have borne late fall or early winter sorts.

We are keeping a ledger account with each variety sent out as to behavior of tree and character of fruit. In cases of doubtful identity we may find it necessary to coin new names if found worthy of general culture.

The following paper was next upon the programme:

FRUITS OF THE SOUTH.

By J. Saul, of the District of Columbia.

The time which our society has to devote to any one subject at our meetings, must necessarily be short, I have as a consequence selected one particular subject bearing on peach culture, one of the most important fruits of the South, if not the most so; and of this, only the stock on which the peach is budded.

It is well-known to growers that in England and the continent, great care is given to the selection of the stock on which the peach is worked. I speak more particularly of England where I happen to be best acquainted. The stock-growers of the County of Surrey, who make this department quite a specialty—growing stocks for the trade—cultivate three or four varieties of plum, and such exclusively from layers; none from seed, as each variety of stock must be genuine. The varieties grown largely are what are known as the Brompton, Mussel, and Pear plum, and those are what are principally used in England as stocks for their peaches. The first named Brompton plum, is an exceedingly vigorous growers, considered by good cultivators too much so, and as a consequence is no favorite: the Mussel plum is of more moderate growth; the greater part of their peaches are budded on it, and invariably do well; there are, however, some delicate growers and delicious peaches that are not quite a success on this stock; such are worked on the Pear plum, on which they do better; this last stock is of more moderate growth than Mussel plum. I would say the fruit of the last is yellow, while the other is purple. It will be seen from what I have stated that extreme care is used in England to find suitable stock for their fruit. The result is well known, notwithstanding their unfavorable climate for the cultivation of this, where trees have to be grown on walls or under glass. When well managed their trees are long-lived, give good crops of the finest fruit and "the yellows," so much dreaded by peach-growers in this country is unknown. I now come to my subject—a most important one.—the stock to be used on which to bud peaches in our climate; and I here unhesitatingly say for the latitude of Washington and South, there is nothing to equal a healthy seedling peach. But right here is the question: Where are we to get healthy seedling peach stocks? Not by sowing seed gathered up indiscriminately anywhere and everywhere; and if I am rightly informed what is called southern peach seed is often the produce of stunted scrubs far from being vigorous and healthy. Note the great care which the raisers of fine stock give to their pedigrees—the great value of such pedigrees—in their desire to have healthy, pure stock. All this care is quite as necessary in the vegetable as in the animal kingdom. We must have our stock, or strains healthy, vigorous, pure. When I settled in Washington in 1851, I found there an old English market gardener of over forty years standing, the late Wm. Cammack, an excellent cultivator of vegetables, fruits, or anything in the line he handled; among other things he cultivated were peaches, these to a moderate extent, about as much as he could sell at the stalls in market with his vegetables; his peach trees were invariably healthy and vigorous; he assured me he never saw a single case of "yellows" in the District of Columbia, in all those years in which he was engaged as a cultivator. His practice was to raise what peach trees he cultivated, and he commenced by saving seed from which to raise stocks from vigorous growing, healthy cultivated late varieties. Seedlings from Smock were his special favorites; to this, and after good culture, he attributed the health of his trees. His trees were heavily manured whenever he supposed they needed it while carrying heavy crops, just as heavily as his cabbage patches. He was one among a class of good cultivators, who did not

expect to get fine crops of peaches, and healthy, unless he fed them.

A few years back I read in the American Farmer a letter from the late Col. Wilkins, in his time one of Maryland's most successful fruit-growers. It was on this subject: "The selection of seed from vigorous, healthy cultivated varieties;" and as near as I can recollect, I write from memory, he stated the healthiest lot of trees he ever had were grown in that way. In 1860 or 61, I again wrote from memory, there appeared in the Horticulturist a communication from the late Wm. Read, of Elizabeth, New Jersey, in his day, well-known as an excellent cultivator; in it he expressed his views pretty fully about "yellows," which he considered a worn out, debilitated state of the tree, brought on by bad stock, unhealthy buds, etc.; in a word, bad cultivation. And such are precisely my views. We can find parallel cases any day among all clases of plants, vegetables or fruits, wearing out, as it is very frequently called; but more correctly, bad cultivation, bad selection, poor soils, etc.; in a word, neglect. To sum up, I would say, select seed from the most vigorous, healthy, cultivated trees. I say, cultivated trees, as it is rare to find wildings sufficiently vigorous. Select your buds from healthy trees, be as careful of your young trees as the stock raiser of young animals would be of his; plant permanently in good suitable ground, feed your trees when they need it, thin your fruit when necessary, don't over-bear your trees, and the result will be vigorous, healthy trees, with no trace of "yellows."

In continuing the subject, a communication was presented by the Secretary from Natt. Stevens, of Texas.

The next subject taken up was

INSECTS INJURIOUS TO FRUITS AND REMEDIES.

By W. R. Lazenby, Columbus, Ohio.

He said in brief: Our insect enemies no doubt are on the increase, and have been for the last ten years. There is a very general ignorance in the use of insect remedies, from the lack of knowledge regarding the different stages of insect life.

Remedies are of two general classes, those which kill and those which repel. Insects which do their injury by feeding on the plant, can generally be killed by poisons applied to the plant. There is a false idea that the application of poison kills by direct contact with the insect, instead of by being eaten. Poisons to be eaten should not be too strong or the insects will stop feeding and not be killed. The requisites for remedies of the first-class, *i. e.* poisons, are: 1st. They must be harmless to the plant and those who use the plant; 2d. They must be effective; 3d. They must be cheap enough for the purpose; 4th. They must be simple and easy of application.

Pyrethrum and the kerosene mixture are remedies which kill by direct application. (The preparation and use of these remedies having already been published will be omitted.) In conclusion Prof. Lazenby spoke a strong word for the birds. He thinks all birds we have are more useful than injurious, except perhaps the English sparrow in some places.

In the discussion which followed, J. C. Plumb, of Wisconsin, called attention to the use of white arsenic as an insecticide. Its cost being much less than Paris green, recommends it. It is used in solution prepared by boiling. Great caution is necessary as the vapor is poisonous. The proportion for use is one pound to two hundred gallons of water.

J. L. Budd mentioned its successful use in Iowa and California, especially for the codling moth. He thought it not especially dangerous, though he had known sheep to be poisoned by eating grass among trees sprayed with it. In preparation it should be first boiled with a small amount of water, and then mixed with a larger amount for using.

P. M. Augur, discribed a way of making Paris green by mixing two solutions, one of copper sulphate, the other of white arsenic.

A paper then followed upon

HARD PROBLEMS IN POMOLOGY.

By J. L. Budd, of Ames, Iowa.

To write a brief paper on the hard problems of horticultre in the Northwest, and of our long continued efforts to solve them, is no easy matter.

Our climate is peculiarly inter-continental, and our rich prarire soil and warm autumnal rains are specially unfavorable for the perfect

ripening of fruit trees not strictly determinate in habit of growth.

In the early days of prairie settlement we naturally followed the lead of the East and South in the matter of selection of varieties planted, and quite as naturally the Atlantic States followed the lead of the sections of Europe least like any part of our country in climate.

The sifting of this Eastern list has been a slow process, as our test winters occur at long intervals. Year after year since 1856 7 our lists of orchard fruits have been revised by our active horticultural societies, yet to-day the north half of Iowa and Illinois and the South half of Minnesota and Wisconsin can show more dead or crippled fruit trees than has been known at one time in the world's history. Slowly but surely we have been conning the lessons long studied and well known to the managers of the many experimental stations of Europe.

The varieties of the apple, pear, cherry and plum which have stood unscathed, our extremes of summer heat and aridity and the extreme variations as to temperature and moisture of air of our test winters, we unvariably find to be indigenous to climates like ours in Europe or Asia, or are seedlings of such varieties. The opinion of some novices that trees are not natural to our prairie soil remote from the bluffs along our streams, is shown to be groundless by the thrifty and rapid growth of our groves and shelter belts, and the equally perfect health, longevity and fruitfulness of our thousands of trees of the Oldenburg apple.

The extended trial of more recently introduced varieties from the natal home of the Oldenburg has now quite generally fixed the popular belief that we must solve the problem of varieties by introducing them from the inter-continental sections of Europe and Asia. If not up to our highest standard of excellence in quality we must trust to seedling production from the hardiest forms where standing near our short lived sorts, such as Grimes' Golden.

For a number of years many of our experienced fruit growers have urged the establishment of systematic experimental stations for the testing of vareties on varied soils; to determine the varieties and conditions least favorable to blight; to test the relative success of root grafted and top worked trees, etc.

The demand for such trial stations has grown more urgent after our recent test winters, as it has become more and more evident that our settlers from every part of the east and of southwest Europe continually repeat the mistakes made in the early days, as each one is naturally prejudiced in favor of the varieties, modes and methods of his native State or country. Two years ago we were able to secure the passage of an act in our Legislature making such increase in the annual appropriation to our State Horticultural Society as to permit the establishment of twelve trial stations in addition to the central station on the grounds of the Agricultural College at Ames. With increased means and experience other stations will be added.

The line of experimental work at these stations is determined by vote of the society and is directly under the general management of a committee of three.

The varieties of the orchard fruits, and of ornamental trees, shrubs, small fruits, etc., furnished these stations, are paid for by the society and become the property of the experimentor, under some restrictions as to severe cutting for propagation, and the propagation or sale of varieties furnished for trial, which are not yet on the market.

That the reports from these stations, joined with the general report of the *ad interim* committee will result in rapid advances in the work of solving some of our knotty problems we cannot well doubt.

The society also offer premiums to encourage the planting of groves and forestry shelter belts, and also liberal premiums to encourage the planting of seeds of fruit trees where growing under conditions favorable for combining hardiness of tree and desirable size and quality of fruit.

The experimental work on the College farm at Ames is directed mainly at this time to the trial on the home grounds, and the propagation and dissemination to trial stations over the northwest of the orchard fruits, forest trees, ornamental trees and shrubs of the great plain which covers like a blanket fully three-fourths of Europe on the northeast. We also test and propagate for distribution to trial stations the promising local varieties of the fruits within our own borders, or in like trying climates of the cold north. Not well-known ornamental trees, shrubs, conifers, etc.,

of promise which have behaved well for a series of years in trying localities are also on trial.

To make up for our deficient appropriation from the college fund and the State, a small price is charged for all plants sent out for trial.

While at this time a feeling of despondency and discouragement is quite common among our planters the outlook for the near future is favorable to conquering the situation.

A paper on the same subject was received from G. W. Lawton, Lawton, Michigan:

What is a hard problem? Is it not virtually a question that has, in theory or in practice failed of being answered? And questions raised in pomology, that remain unanswered, should they not fall into the category of hard problems?

This implies that there are easy problems in pomology; that there are questions therein that have or may be easily answered. But what they are, or how far indeed they have been or can be satisfactorily answered, others must decide.

For my part, judging from my own experience with pomological questions, if I may be permitted to refer to it, I should say, it is very easy to be mistaken, and to entail on one's self, losses and bitter disappointments.

Still in a general way, it may be said some questions in pomology have been answered—practically answered, through certain results obtained. But it must be remembered that results never exhausting solve a problem, where the seasons are one of the factors, as is assuredly the case in pomology. You may run back over all the gathered experience in vine and fruit-tree planting, and you will be met with innumerable questions, springing up out of this experience, that appear to be of prime importance and are not readily replied to. Answered questions in pomology constantly suggest unanswered ones, which keep the real pomologist active in endeavoring to meet them.

Perhaps here lies the secret of the general superiority, in patience and amenity, so observable of fruit-growers, beyond other food raisers. One need only to reflect upon the self-restraint—the mental discipline, the pomologists must submit to, in order to succeed, to discover that it could not well be otherwise. No "weariness" in fruit-growing, is tolerated in mind or body, if one would succeed. Activity in both are prerequisites; and this brings us to one of its admitted hard problems, viz:

Why is it so difficult for men to submit to such discipline? Perhaps no pomologist ever entirely does. Perhaps with the most devoted, the trials, disappointments, overthrows, attendent upon it, are accepted with many mental reservations for the compensation resulting. But we perceive, practically, that while hours and days of gloom, if not of positive sorrow, fall like foul weather upon the willing and unwilling, with great impartiality, the readiness with which the submissive one responds to the warm rays of the returning sun, marks the two and makes the difference to be observed in the consequent growth and development of the one over the other. It is indeed a hard probled to acquire the earnest devotion pomology demands as a condition of success, but in the end it develops the pomologist.

It is a common and true saying, that may well be kept in mind, that man was made to work, mentally and physically. Even Adam was not idle when in the garden of Eden—except when listening to the story of the serpent. He labored. He dressed and kept the garden with probably no disappointments attending his labors—they came in, after the expulsion, with the briers and thistles. But while in Paradise he enjoyed every tree "pleasant to the sight and good for food." How encouraging was the assurance given him when driven out upon the face of the untilled earth, that the sweat of his brow should procure him his daily bread! That he should not starve—a promise and comfort that all pomologists may remember and share in! But the recollection of the pleasures of that garden not only remained, we must suppose, with our great progenitor in his after life, but has haunted his children to this day. A notion lurks about them that they may ultimately get back into the garden—at least that pomologists may—as from the limited account of it, it seem to be especially adapted to them. At all events, we all want to get in there, or in default of re-entering the original Eden, we want one of our own, and here How to get for ourselves such a garden is another and the chiefest of the hard problems to be worked out in pomology. We attempt it, to create our own Eden, and meet with failures. The bottom of the sea is not more thickly strewn

with wrecks than is the earth with dismantled Edens. Still we struggle on. Had Adam kindly written out his experience while in the garden, and left us a clear account of the soil—the exposure, the drainage, atmospheric and aqueous—and had also given us his manner of cultivating and fertilizing the garden, including his experience with commercial fertilizers, and his system of pruning and training the trees and vines, and by what devices he disappointed the cut worms and other vine and fruit-tree devastators, and told us how he avoided the mildew and blight, and just what Bacteriæ are anyway, so that we could have improved upon him, how we would thank him! What honors we would have bestowed upon his memory! But, alas! He did nothing of the kind. Indeed, he did nothing toward planting the garden, which accounts for his under appreciation of it, and why he was not sufficiently interested in it to send down to us an account of it. No risk of location, of choice of soil, of sun, nor kinds and varieties of trees, "delightful to see and good for food," troubled him. He had been secured against all this, and pomologists know from hard experience how they wish they could be. But it can not be—it is, ordered otherwise, and each one must determine these questions for himself, with unnumbered obstacles in his path to discourage him, to discipline him into a proper appreciation of a garden when he gets one But how and where to develop his Eden, is in each case tried, not an easy problem to be performed.

But I must leave this subject for others. A few suggestions and I am through.

An incipient covetousness attends our aspirations in pomology. We dream of the original Eden, and not entirely with the view of its being the ideal Eden, to be formulated in the lesser Edens we construct, for we constantly regret its loss. There should be no dreaming over this, nor for that matter over our neighbors work and success. We may study what another does, reflect upon it, and then go to work to build our own Eden. (1.) We must select a proper location. All the conditions should be understood that are possible of being known then, and upon selecting it we should fall in love with it, liking it better than our neighbor's. (2.) Then we must learn all about our soil and what it needs—remembering that it probably differs even from the adjoining lot, that seems to blossom under such and such treatment. (3.) We must discover what kinds or varieties of fruit will flourish best upon it, not forgetting that just over the fence another variety may do better than with us. (4.) What training and pruning these varieties may need on our location, not overlooking what currents of wind, and how strong, our location may be subject to. Indeed there are questions upon questions rising out of every effort to develop an Eden of our own, and which are not always those which our neighbor has to meet, and in fact are not in the main just what the horticultural writer, and tree agent are able to solve, notwithstanding their general assurance to the contrary. In brief, let us keep in mind that we and all we attempt are immersed in infinity, with no end to problems of all degrees of obscurity, coming up before us to be worked upon. And that we are to solve them ourselves, and are not to blindly listen and follow the advice of some others, which, if we do, will be found equally as potent in casting us out of our Eden as was the voice of the serpent in expelling Adam from his.

P. M. Augur, of Connecticut, offered the following resolution, which was adopted:

Resolved, That the State Horticultural Society of each State, or where there is no such society existing, the State Board of Agriculture in such State, be urged to empower a specified number of intelligent and impartial experts who shall receive and fairly try all such fruits as may be submitted to them, and report to the said boards, and through them to their States and the world.

The Treasurer, Benj. G. Smith, being obliged to leave, on motion of W. J. Beal, W. R. Lazenby was chosen treasurer *pro tem.*

Chas. A. Green, of New York, was called to the chair for the remainder of the afternoon.

In continuation of the programme, a paper was given upon

CULTIVATION OF THE COCOANUT IN FLORIDA.

By E. T. Field, of Middletown, New Jersey.

It is said the percentage composition of the fruit, is water 39.7, oil 29.3, amygdaline 14.0, woody fibre 9.5, sugar, 3.6, gum 2.01, analcime 1.1, albumen 0.5, mineral matter 0.2.

The tree belongs to the cocos palm family, is a saline and partial air plant or tree, and will grow only in tropical climates. It is claimed to be a native of the tropical islands in the Pacific, but has been disseminated by transportation, by

the will of man, and by the action of the wind and currents of the sea (as a great many fall from the tree on the waters' edge) until it now grows in almost all parts of the world where the climate and soil will permit. It is estimated that upwards of one hundred millions of the trees are growing in the East Indies. Some of the principal places are on the Malabar and Coramandel coasts, Ceylon, Borneo, Java, and Cochin China. It grows on the coast of Africa, to some extent, and it has been planted in Australia quite largely. In many of the Pacific islands it grows luxuriently; a large portion of the plantations are owned and controlled by capitalists of Germany. It grows well in the West India Islands, and on the islands in the Caribbean Sea, where it is the principal product. On the South and Central American coasts it succeeds exceedingly well. It is found in very limited numbers on the Keys and along the coasts in South Florida. It is met with (growing in a dwarf state) in collections of plants belonging to horticultural gardens in temperate climates, but does not produce fruit in these positions, yet should be in all choice collections as an ornamental plant.

Description.—The growth where the situation, soil, and climate are suited to it, is sufficiently vigorous to outstrip all other vegetation. The plant grows from the nut. The trunk or body of the tree is a strong, tough wood, from eight to eighteen inches in diameter, and attains a height of from fifty to eighty feet; is liable to be more or less crooked, caused by the action of wind against the leaves and fruit on the top of the tree. The leaves are pinnate, growing from fifteen to twenty feet long, dark glossy green; the blossoms are encased in a spathe, sheath-shaped, near the crown of the tree, the same color as the leaves, about three feet long, ten to twelve inches in circumference in the center, tapering to a point on the outer end, and to the stem on the other end, it being about six inches in circumference, which opens, and you see the fruit spur covered with the yellow bloom, and the nut, which is about one inch in diameter, set upon each branch of the fruit spur, about three inches out from its junction with the central or main stem. The number of these small nuts on a fruit spur is sometimes forty, but part of them drop; the number remaining to maturity varying from five to twenty, depending upon the condition of the tree to support its fruit; these fruit spurs appear about one each month, and as the nuts gain in size their weight causes them gradually to droop until at full size the spur is bent in a curve, the outer end having turned down, some of the nuts resting against the body of the tree, and base of the leaves. The fruit is encased in a tough fibre husk varying in thickness from one to two and one-half inches; the next covering is a hard shell about three-sixteenths of one inch thick; then the kernel is reached inside the shell, which when matured is from three to five-eighths of an inch in thickness, this being filled with the milk.

Uses.—The wood is used in some parts of the world for building purposes, for furniture, and ornaments. It is known in commerce as porcupine wood, and is susceptible of a high polish; the leaves are used for thatching habitations and other buildings. The husk contains twenty-five per cent. fibre, which when separated, is used in the manufacture of coir, it being converted into cordage, rope, bags, and matting, and for upholstering mattresses, etc.; while many of the brushes now in common use are made of fibre obtained from the leaf and husk. The shell is used for making cups, dippers, and vessels of like uses; a vegetable charcoal can be made from it, and it is also ground and sold under the name of spice mixture. The kernel supplies food to many of the human race. In the tropics it is generally used while in the soft or jelly state, eaten with a spoon. The milk or water is transparent until the kernel is formed and hard, when it becomes white or milky in color; while this transparent state exists, the water is used for drinking, to a great extent taking the place of spring water.

In a number of instances the cocoanut has proved itself a true friend to man; in cases of shipwreck, the survivors have reached the shore with no food and nothing there, except cocoanuts, which supplied the only sustenance for months; vessels have provisioned with them, and continued their voyage to a successful close, which otherwise could not have been done, as other provisions could not be obtained. Oil is extracted in large quantities, and forms not by any means, a small item of the world's commerce. The spathes are tapped, and the juice of the tree

drawn and manufactured into jaggery and arrack.

Quite a number of articles have been written on the cocoanut, but only a small amount of information applicable to practical use in its growth or improvement, has been given. The cause is attributed to the want of experience on the subject, nearly all the writers are those who have paid only slight attention to investigation, but using such information as was obtainable conveniently.

A very large proportion of the inhabitants of the tropics are uneducated; while nearly all the educated portion are more or less wealthy, and the climate is not conducive to great energy, hence, they pay very little attention to the details, but depend almost entirely upon the employees for the management of their interests, which can be easily done, as the income is large. Writers appear contradictory in their versions, owing in a great measure to having obtained their information from different places; there are very many points which appear antagonistic, many of which will be made plain when the subject has received proper attention by pomologists and horticulturists. In planting, some claim it must be done at certain times of the year; just such nuts must be used, and must be placed in described situations to sprout; must be placed in the ground at a certain time, and in a peculiar position. We can but enquire, is this done by the tree as it drops its fruit? or by the ocean wave when it casts a nut on the beach? yet by these two sources have a very large percentage of the cocoanuts been planted since the creation of the world.

In the selection of a plantation, great care should be taken, if success is to be guaranteed, and if this be done, it will be sure; some of the principal points to be considered are temperature, soil, location, seed, planting, and last, but not least by any means, healthy country. The temperature ought to be from 65 to 90 Fahr., although the trees will grow successfully at considerably lower and even higher temperature. For soil, a porous coral sand is the best, the more decayed vegetation in it, the better; the coral or lime soil contains the requirements needed, and when any other soil is chosen, these requisites must be supplied, and even then they will not grow nearly so fast, nor will they commence bearing so young, nor produce the quality or quantity. A location near salt water is claimed and proved to be the best; the closer the better, even to the water's edge; here is generally where the best soil is found. Upon examination the most successful locations are on coral formation, situated in or along the track of the warm currents of water running from the equator. Attack of insects is found to be local; the cause needs investigation; a very small percentage of the whole industry is reported to be seriously affected. Rapidity of growth depends largely upon the situation, bearing age commences at from four to seven years on a coral sand along the sea, while in the same country a short distance inland it will take double the time to arrive at producing age, and when arrived at, the quantity will not be over one-half; if the soil be considerably inferior the percentage will be still less. The number of nuts vary greatly; from forty to two hundred annually are the numbers that have been produced, many less than forty to the tree would be a failure financially; one hundred to the tree would be a very good yield.

Healthy location is very important; in many sections of the tropics malignant diseases are prevalent a large portion of the year, especially fever. Cultivation is not needed in choice locations; the young plant likes partial shade, while native growth of vegetation protects the ground from drought during the dry season, the roots of the young plants having as yet not made sufficient growth to reach permanent moisture, as in favorable situations they will, before bearing age is arrived at. There is no need of watering unless planted upon a soil where there is no moisture, and in that case the undertaking will be a financial failure, even with watering. The cocoanut has flourished for centuries without fertilizing, watering or cultivation in is native places. Distance apart from each other should be so far that the leaves do not interfere. Seed nuts should be fully matured upon the tree, of large size, planted in the natural state in the whole husk, and planted where the trees are to remain, and three inches below the surface.

The consumption of cocoanuts in the United States amounts to many millions annually. They are obtained from nearly all the West India Islands, on the Central and South American coasts, and on islands in the Caribbean Sea.

The importation of them has increased from 1869 to 1884 about fourfold; at the same time the price has been steadily advancing; there is considerable difference in the quality of the fruit, and some commands much better prices. They are received principally at the following cities: New York, Philadelphia, Baltimore, New Orleans, Savannah, Boston and Charleston. There are great numbers preserved, so that they can now be shipped all over our vast country at little expense. An immense business is done in dessicating the nuts; vast quantities are stored in different stages, from the sack of nuts to the labelled package, boxed ready for shipment. There are eight firms engaged in the same occupation in the country. In the process of manufacture, the shell is removed with hatchets, the brown coating next is pared off, from which oil is extracted; the kernel is then ground, and dried, sweetened, and packed in barrels, boxes, pails, packages and cans. Oil is extensively imported from almost the entire tropics. Vessels have gone to the islands in the Pacific, remained for months pressing out the oil, returning with a very small cargo, and yet make it pay handsome profits. When improved machinery is used for manufacturing all the products of the cocoanut palm into useful articles, the demand will be greatly increased. It is now more of a luxury than a staple in most countries outside of the tropics, although several parts of the product are to be found in the quotations of the daily market reports.

Will the cocoanut palm, grow in the United States? Yes; a sufficient number of trees are in the different stages of growth, from the planted nut to the age of forty or more years, in South Florida, to fully demonstrate the certainty of success. It is a safe estimate to place the average number of nuts per tree at one hundred, now, on the bearing trees; these trees compare favorably with the most successful in other countries in quality as well as quantity. Not until recently was attention called to this industry. About half a dozen years since a few thousand were planted at Lake Worth, a part of which are now in bearing. Since that time some of the residents of Key West have planted several thousand on the Keys. The following is copied from the Florida Annual of 1885, published at 140 Nassau street, N. Y.: "An acre will support fifty cocoanut trees, that require no fertilizing, no fencing, and no pruning At from nine to twelve years of age these trees mature from eighty to one hundred and fifty nuts to the tree. Suppose they only bear forty to the tree on an acre of fifty trees and are sold at one cent a piece. But cocoanuts do not sell for one cent apiece anywhere, and when they bring five cents apiece and the yield is 20,000 to ten acres, the comfortable annual income of one thousand dollars can be literally picked up in the sand. No fear of ever glutting a market either; for whatever may betide other fruits, there are boys enough in the country to use up all the surplus of a cocoanut crop—who are the people to grow these, and where will they come from?"

Nearly all the Keys are of a coral composition, having a strip of coral sand varying in width from a few to hundreds of feet down, a large proportion of which has been planted with the cocoanut.

From Cape Florida north, for a distance of ninety miles, running parallel with the coast, there are bays, rivers and sounds disconnected by narrow strips of land, but themselves connected by inlets to the ocean, through which the tide ebbs and flows; between these and the ocean lies a strip of land varying in width from about twenty rods to a little over a mile, the formation of which is largely of coral sand, the greatest elevation being nearest the ocean and a gradually descending grade to the west. This chain of inland waters receiving the fresh water flowing from the Everglades prevents its leaching through this strip of land. The temperature of the Gulf stream at Cape Florida being from 79° to 80° Fahr. Easterly winds frequently drive the Gulf stream waters against the beach along the coast as far north as Lake Worth, thus producing a tropical climate and growth of vegetation.

From the requirements needed for the success of the cocoanut, it appears there are a few thousand acres in South Florida suited to its successful production, the climate and soil being what is desired; a perfectly healthy location, with the advantage of being much nearer the markets of the United States (one of the best the world affords) than any other tropical country. The advantages of this fruit grown in Florida over other fruits in this country are numerous, some of which are the above claims. To these may be

added that they will keep for months, hence none need be lost; inexpensiveness, as little attention is required; there is not sufficient territory to produce enough to over-stock the market, for the number will not exceed, probably, over one million of trees; it is now a luxury; the demand is increasing, which will eventually make it a staple; in a few years it will be used during the summer in its green state, in the same manner as it is now used in the tropics.

Experiments are now being made to separate the fibre by means of machinery, and, when perfected, this will utilize the husk, a valuable part which is now thrown away in America.

The above quotation states, that an acre will support fifty trees. A tree will thrive equally as well on a space of four hundred square feet, and an acre will support over one hundred trees at this distance.

Discussion of new varieties of fruits continued.

P. M. AUGUR, Connecticut: I would like to hear about Hathaway's No. 5 Strawberry.

B. HATHAWAY, Michigan: It is being tested by a number of growers, and I would rather not say much about it at present. It is, however, out of many varieties, the most promising berry I have for my location.

C. A. GREEN, New York: It is of good quality and a good grower.

T. V. Munson, of Texas, chairman of the committee to examine the Worden grape, on the grounds of Messrs. Munson and Knapp, made a verbal report of the visit.

J. S. WOODWARD, New York: The Jewell strawberry is remarkably promising with us. It is of good size and productive, and of better flavor than the Sharpless. It ships well.

J. B. ROGERS, New Jersey: I have grown the Jewell two years and have seen it on Mr. Augur's place. It is a vigorous grower; fruit large to very large, and extremely productive. I consider it a fruit worthy of trial.

P. M. AUGUR, Connecticut: As I am the originator of this berry, I want to explain that its name does not mean that it is a "jewel" of a berry, but it was named in honor of my friend, the Hon. Marshall Jewell.

C. A. GREEN, New York: It is very promising.

J. S. WOODWARD, New York: It is very productive on poor soil and improves with any amount of fertilization.

FRIDAY—EVENING SESSION.

The exercises of the last evening consisted chiefly of short, pithy speeches from representative men on a variety of topics, somewhat connected with pomology, according to the custom of the Michigan Horticultural Society.

At about half-past seven o'clock the meeting was called to order by the Secretary, W. J. Beal, of Michigan, who called to the chair Charles W. Garfield, of Michigan, Secretary-elect, to conduct the exercises of the evening.

The first on the programme was a piece of music by the Grand Rapids Schubert Club.

The Chair then called, as the first speaker, J. C. Plumb, of Wisconsin, to give "An Outsider's View of Michigan." In response he said that he had known the State from its youth up, as he passed through it at an early day on his way to Wisconsin, and that he planted the first fruit tree ever set in this State. He spoke of the great mineral wealth of Michigan, but believed that in time the fruit interest would be greater than any other.

T. V. Munson, of Texas, was called out with the topic, "Flooding with New Fruits—The Remedy." He said in substance: The only way I see out of the difficulty is through an organization for the purpose; perhaps somewhat like the Agricultural Experimenters' Society. Let it consist of from one to three dozen tried men; keen observers, systematic originators, who can work well together, who will thoroughly test all new fruits presented to them and advertise the result. Let the originator agree, in case of an adverse decision, to drop the variety entirely. If the report is favorable, let each member of the society have a share in the profits of its sale. This would save much of the expense now attending the introduction of new sorts, and help to keep out worthless sorts.

C. A. Uber spoke of "A Problem in Virginia." "The problem is one that sprawls under a tree in summer, and in winter roams about with a shot-gun and one or more dogs at his heels. He is a better judge of the ripeness of a watermelon in the dark than other people are in the daytime. He is constitutionally fatigued, but can make good time husking corn or gathering fruit for himself in another person's field at night. This is our problem; how shall we solve it?"

Some one in the audience suggested the "northern schoolma'am."

P. M. Augur responded to the topic, "The Land of Steady Habits." "I think," he said, "that Connecticut has at least one steady habit, and that is of sending her best men and women to Michigan." He referred in a pleasing way to the steady demand for Connecticut nutmegs. "Another ancient custom of our State was to whip beer barrels on Sunday, and I know a great many Connecticut women who are getting ready to whip beer barrels as they never were whipped before in the world."

Byron G. Stout, of Michigan, being called upon, expressed his pleasure at seeing so many present from other States, and gave a sketch of Michigan's growth, advantages and further needs in the way of transportation, etc.

Kizo Tamari, of Japan, mentioned some of the progress made in that Island, largely through American influence, and thanked the Society for the great benefit he had derived from the meeting.

J. J. Toon, of Georgia, responded to the sentiment, "A Smile from the Sunny South." He expressed his great delight at being present at the meeting, and called attention to the similarity in enterprise between Grand Rapids, Atlanta and Chicago. Anything that Michigan can grow in the way of fruits, he said, can be grown in Georgia, and many others beside.

"The Art of Seeing Correctly" was spoken of by W. J. Beal, of Michigan. He described how, when a student of Prof. Agassiz, he was kept for six weeks looking at the structure of some sea eggs. "People's minds," he said, "run in different channels. It is necessary to thus confine one's attention if we would become thorough

in anything. In teaching botany at our college we have students first learn to see well; then they may become good reasoners."

E. Moody, of New York, spoke of "New York the Cradle of Michigan." He came from New York to Michigan in 1835 and was two weeks in reaching Kalamazoo. One of the first things he did was to plant a peck of peach pits, the trees from which supplied, for a long time, the village of Allegan with peaches. He described the hardships of the early pioneers, and the changes which had taken place since they came to the State.

"Health at the End of the Hoe Handle" was responded to by F. M. Hexmer, of New York. One needs besides his business some other systematic occupation, and if his business be one requiring mental labor only, this side occupation should afford physical activity. The work of the garden has always been held the best of anything of this kind; therefore most successful business men have their country places, which take them from the influence of the busy cities, and yet give them employment.

J. B. Rogers, of New Jersey, spoke of "Manuring with Brains." He referred to the fine school houses which he saw on coming into the State, and to the thriving condition of its societies of horticulture and agriculture, and concluded that Michigan was well manured with brains. He urged that those interested in horticulture should see to it that horticultural education be furnished in the schools.

J. L. Budd, of Iowa, was called out on the suggestive topic "Apple Sauce." He said: "At Chicago I was given a pass over the Michigan Central railroad, and told to tell a good story of Michigan when I returned, for she deserved it. I find, as regards fruit growing, at least, that such is the case. I see your orchards in fine condition and laden with fruit, while at the west, and much farther south, they are killed by the winter. We mean yet to grow good fruit in the west, but it takes careful selection to find varieties adapted to our climate."

"Our Choicest Home Fruits—The Boys and Girls," was responded to by J. S. Woodward, of New York. This he said is the most important subject that can engage the minds of the American people. When we think of how little care is often given to the training of the young, it is surprising that we do not degenerate instead of advance. He urged greater watchfulness in the care of the children, as the results of such labors are eternal.

The last topic: "We are Honored by Our Guests," was responded to by S. L. Fuller, of Michigan. He said: "I remember meeting a few years ago with half a dozen gentlemen in this city and helping to establish what is now the Michigan Horticultural Society. I did so because I saw great possibilities in the fruit interest. I saw that the far western wheat interest would overshadow ours. I am proud of the class of men engaged in pomology. Governor Bagley once said: "I do not know whether all the good men raise fruits, or whether it is fruit-raising that makes such good men." Why does the American Pomological Society come here? It must be that we have done something in fruit-raising. A few years ago no one would have believed it possible that a meeting of this kind would come to this city. When I see here those whose names I have known in the horticultural and agricultural papers so long, I feel that our city is truly honored by their presence."

The society then sang the Doxology and adjourned.

REPORT OF THE STATE FRUIT COMMITTEES.

REPORT OF THE GENERAL FRUIT COMMITTEE.

To the President and Members of the American Pomological Society:

GENTLEMEN:—The undersigned on behalf of the General Fruit Committee respectfully reports that, in the month of June last, and again in the month of August, the following circular was addressed to the several chairmen of the State Fruit Committees:

AMERICAN POMOLOGICAL SOCIETY.

(ORGANIZED 1848.)

To

Chairman Fruit Committee, for State of

DEAR SIR:—At the last session of the American Pomological Society, held in the city of Philadelphia, September 12th, 13th and 14th, 1883, you were appointed Chairman of the Fruit Committee of your State. The duties of this Committee are defined in the Society's by-laws, as follows:

"State Fruit Committees, consisting of five members each, for every State, Territory and Province represented, and a General Chairman over all, shall be appointed biennially. It shall be the duty of the several State Fruit Committees to forward the General Chairman, one month before every biennial meeting, State Pomological Reports, to be condensed by him for publication."

It is customary for the chairman of the State Fruit Committee to select his associates, and you are respectfully requested to organize your Committee at the earliest moment practicable, if not already done, by selecting the most competent and trustworthy persons in different sections of your State to aid you in collecting the information desired by the Society, and transmit the same to me as early as the first of September next.

The nature of the information desired may be briefly stated as follows:

1st. SPECIES OF FRUIT.—What species of fruit, as Apple, Pear, Peach, Plum, Cherry, etc., etc., are grown successfully in your State?

2d. VARIETIES OF FRUITS.—What varieties of these fruits have been found, by experience, best adapted to the soil and climate of your State and its various parts? The degrees of merit should be stated according to the scale adopted in the Society's Catalogue, viz: those worthy of cultivation designated by one *; those of great superiority and value by two **; those of more recent introduction and giving promise of excellence †. In this connection you will please examine the lists of varieties, if any, recommended in the Society's Catalogue, for your State, and suggest such changes or additions as may, in your judgment, be necessary.

3d. NEW NATIVE VARIETIES.—If there are any new varieties of recent origin in your State, giving promise of excellence, you will please make special note of them.

4th. SYNONYMS.—Give as much information as may be in your power in regard to the different names by which the same fruit is known in your State.

5th. OBSTACLES TO SUCCESSFUL FRUIT CULTURE.—What are the chief obstacles to successful fruit culture in your State, as regards soil, climate, insects, diseases, etc., and what remedies have been most effectually employed?

6th. CULTURE AND PRUNING.—What treatment of the soil of fruit tree plantations, and what system of pruning, have yielded, in general, the best results?

7th. STORING AND KEEPING WINTER FRUITS.—What methods are most successfully practiced?

8th. PACKAGES.—What sort of package has been found most advantageous, especially for shipment to distant markets, and especially to Europe?

9th. STATISTICS.—If convenient, statistics showing the extent and progress of fruit culture in your State.

If, for any reason, it may not be in your power to report upon all the points enumerated above,

be kind enough to do what you can, giving precedence to 2d and 3d, relating to "Varieties of Fruits."

In cases where State Committees have made full reports at recent sessions, they will not be expected to go over the same ground again, but will simply report such changes in regard to the value of the varieties as later experience may justify; and such new facts in regard to the general subject of fruits and their culture, keeping, marketing, etc., as may have come to light since the last report.

The 9th point, "Statistics," showing the extent and progress of fruit culture in your State, will always be interesting and instructive. The extent of recent planting the largest orchards, the varieties most extensively planted, average prices of the various fruits, estimated value of total fruit production in the State, etc., etc.

Rules of Pomology.—The attention of State Committees is respectfully called to the Pomological Rules and changes in nomenclature adopted at the last session, and printed in full in the last edition of Transactions. It is desirable that the reports should conform to these rules and changes as far as possible.

The next meeting is to be held in Grand Rapids, Mich., commencing Wednesday, September 9th, 1885, and continuing for three days.

And now I ask of the State Committees to continue their kind co operation. Through their reports the society must accomplish its most important work.

The thirty or more reports published in the last volume of Transactions, contain a vast fund of information in regard to the fruit culture of our country that could not be obtained from any other source.

If you have not received a copy of the last volume of transactions, you can procure it by addressing Prof. W. J. Beal, Secretary, Lansing, Mich.

Respectfully,

W. C. Barry,

Chairman General Fruit Committee, Rochester, New York.

Responses and reports have been received from twenty-four States and territories.

In three instances the circular failed to reach the parties to whom it was addressed. These were Louisiana, Idaho, and Wyoming. Several States that had made full reports at the previous sessions, have not reported at this session, chiefly because they thought they had not sufficient fresh information to base a report upon. It is gratifying to the committee to be able to state that the reports received show an excellent appreciation of the society's work, and a hearty desire to co-operate in carrying it on. The chairman of the general committee desires here to thank the gentlemen of the State committees who have so promptly and so well performed their duties, and hope they will continue their good services in the future.

Respectfully submitted,

P. Barry,

Acting Chairman General Fruit Committee.

NOVA SCOTIA.

Reported by Charles E. Brown, of Yarmouth, Chairman of Provincial Fruit Committee, of Nova Scotia.

On the receipt of your circular in June, I addressed five leading fruit growers in as many of the best fruit growing counties of the Province, asking contributions to report for 1885 of the American Pomological Society, to be forwarded by August 25. The responses up to that date being few, I also notified them of your kind extension to November 12. Whatever may be sent will be forwarded at once. What I have goes with this.

Living in one of the least-favored counties of the Province, where, until recently, but little attention was paid to fruit growing, and only for home use, I have, unfortunately, but scanty material, and no local assistance; but I have kept notes of varieties for twenty years, and have imported many thousands of scions, root grafts, trees and plants, which have been distributed throughout the county. Observation of fruits now brought to market and displayed at our exhibitions gives very gratifying results.

A reference to my list shows that we have now one hundred and two recognized standard varieties of apples grown in the county, of which seventy-seven have borne fruit. Those of which I have no knowledge, imported privately, and introduced by tree agents, whose aim is usually to sell new kinds at high prices, would, no doubt, increase this number of varities by one quarter

at least; while the crop now supplies the home market to a considerable extent, although many thousand barrels are still annually imported from other counties of the Province, from the United States and Ontario.

Of these varieties, the following are not starred in the tabular columns of last report; and, as they were all shown in fine plates or dozens at our county exhibition, October 1885, I would recommend one star to be given to them: Ben Davis, Fall Jennetting, Fall Pippin, Fameuse, Grimes' Golden, Stark and Wealthy.

In the report for 1881 it was advised that Fall Jennetting and Fameuse be dropped, as other kinds were better, and the latter spotted badly, but Fall Jennetting is one of our very best kinds inland, and succeeds in several counties where the choicer kinds fail, while Fameuse is so excellent in quality that its liability to spot in some counties, localities or seasons, should not condemn it for the Province at large; the dozens shown at our exhibition, all grown in the county, were perfect, almost solid, brilliant red, without spot or blemish. The other kinds named do well in the interior of the county; Grimes' Golden even succeeds where it is almost washed by tide-water every twelve hours; a vigorous grower, every branch shouldered, as if expressly to hold its heavy burden of fruit; I can hang my weight, 172 pounds, on a branch not larger than my thumb, holding close to the tree. Contrast this with Oldenburg, in which the crop invariably strips the tree of more or less branches, not much stronger than alder-wood.

It may be objected to Ben Davis and Stark that they are of inferior quality, but the former, at least, is said to sell well in the English market. Both are good growers, good bearers and long keepers. While they are kept on the list at all they should be starred wheresoever they succeed well. The Nonpareil Russet is considered the most valuable apple for export now grown in this Province, supplying the London and Paris markets in May and June, when there is absolutely no other variety to compete with it. To my taste, the Nonpareil is like the famous razors —good only to sell. In a congress of fruit growers, held last season in England, the largest ever assembled there, a vote was taken on their best variety, with the result of a considerable majority for King of Pippins. It appears to me that the inference from that vote is that quality carries no points in the English estimate; preference being given to medium or small in size, symmetry in shape and high color. Pears are sold at £5 per dozen in London, to grace the dinner table; but, wo! to the unlucky guest who should presume to eat one. On this side fruit is grown for consumption; the floral kingdom, more brilliant and more varied, caters sufficiently to the æsthetic taste.

Observing an article on the Salome apple, an Illinois seedling, in the Rural New Yorker in 1883, especially commending its thick, strong leaf, I ordered a few root grafts from F. K. Phœnix, of Delavan, Wisconsin, for the spring of 1884; including also Canada Baldwin, Bishop Bourne (of which I sent the scion), Shiawassee Beauty and Wealthy. Mr. Phœnix kindly added, to be tested, Acker, Brewster, Bunnell, Early Striped Sweet, Foote, No. 1 Red Winter, Potter, Rissler and Walworth Pippin, mostly of western origin. Also, in 1885, with others, Bunker, Switzer and Yellow Transparent. These have succeeded in vigor of growth in order as follows: Acker has grown three to four feet this season, Canada Baldwin, Bishop Bourne, Salome, Early Striped Sweet, Foote, Rissler and Walworth Pippin. The least successful is Yellow Transparent, followed closely by Shiawassee Beauty and Wealthy. The last seems feeble when young, but to gain in vigor with increasing growth. Of some sixty varieties of Michigan apples, sent me for examination in 1884, by Secretary Garfield and Mr. A. G. Gulley, the Shiawassee Beauty struck me as the most attractive in appearance, the coloring being especially distinct and beautiful, but the tree does not seem adapted to eastern conditions, or to succeed as a root graft; indeed it appears to be almost a rule that varieties originating inland are not adapted to the coast lines, and holds good with our own county seedlings. Canada Baldwin, I have seen in March, in perfect condition, a beautiful, solid red apple, of fine quality, probably a seedling of Fameuse, but so much more vigorous in growth that it is worthy of extensive trial.

Bishop Bourne is an especial favorite in my family, preferred to any other variety, dainty in shape and size, exquisite in color, texture and quality, as digestible as Fameuse, ready for use in October, and may be kept until March. It

originated from seed of Ribston Pippin, with William Sutton, of Cornwallis, Nova Scotia; named from his birth-place in England, but has not been much propagated. Ordering five barrels this fall from one of the largest growers in Kings county, he could only supply me by buying, in part. The tree is a strong grower, and an early and abundant bearer. Bishop Bourne is remarkable for large, well-ripened seeds, every one of which will come up about April 20 here, if sowed before the ground closes, say November 20. I have tried seeds of a number of varieties, selecting the best specimens, and marking each lot. Bishop Bourne invariably takes the lead, and has so far kept it in growth. My theory was that I might so get better stocks for grafting, having found very few of my imported trees exempt from canker, and not sure that the stocks might not be at fault.

As a remarkable instance of extraordinary vitality, I saw, about October 1, a small tree of Bishop Bourne, six feet high, with three or four leading branches, that was completely stripped of its bark for some six inches all around the stem, about one foot from the ground, in the winter of 1882–3. There is not a particle of bark in the bare place, and the wood is now bleached from exposure to the weather. Yet, at above date, there were twelve apples on the tree of average size, while several shoots had grown six or eight inches this season. Nothing whatever had been done to remedy the injury, the owner having given it up as hopeless. I have often seen branches and trees maintain vitality with a mere strip of bark, but a case like the above I had supposed absolutely impossible.

Ontario continues a steady growth and improvement, the fruit above medium in size, of good form, and free from blemish; with me, a little dull in color; kept this season perfectly sound until July. Both parents, Northern Spy and Wagener, being long keepers, this quality appears to be intensified in the offspring, and it is apparently a most valuble variety to propogate. Color will, no doubt, be improved under sunnier skies.

Protection from injurious winds through hedges, fences, buildings, or other wind-guards, is an important factor in productiveness, and often the only condition requisite to secure it. I have trees twenty years old that have never borne a dozen apples in all, because fully exposed to the winds, the same varieties bearing annually in another part of my grounds; so, also, the bearing year among the same varieties is changed—if some of the trees are exposed to a damaging wind, at a critical period, while others are protected from it. Again a slight difference of soil, or shelter, or aspect, cultivation, top dressing, or watering, may make the alternative between productiveness and barrenness. Red Astrachan, though valuable inland, is so worthless in my vicinity that nearly all the trees have been top-grafted or removed. Yet a single tree in the midst of the failures, is annually loaded with magnificent, highly-colored, perfect apples. The owner of this one tree would naturally recommend Red Astrachan, but unless he could endow the planter with all the conditions under which his own tree so thrives, only failure would result.

One often sees the question, "Are coal ashes of any value?" I find them of great value; after being sifted to remove the coarser portion, which is useful for walks, gateways, etc.; applied to fruit trees liberally, not a handful or a peck, but a barrow load or more, according to the size of the tree. Both thrifty growth and fruitfulness are promoted. Gooseberry and currant bushes not only thrive with a free dressing of ashes, but the currant worm is kept in check: while I have had no equal growth of strawberry plants with no other application than just ashes forked freely into the soil. With vines also—squash and cucumber—an admixture of ashes with the soil promotes vigorous growth. In light soils or in warmer regions, probably, less useful results would follow the application of ashes.

Among the obstacles to successful fruit culture, I should name, first: A wrong selection of varieties, the guide in this is simply local experience; not a tree agent's plates or representations. Second, improper planting, in ground insufficiently drained and prepared for trees, with subsequent neglect. It is not uncommon to see young trees planted in grass fields, the sod wrapping the stem. To thrive, trees must be fed at the roots and the ground cultivated as far as the roots extend. Third, lack of pruning, the nutriment that would fill a due proportion of branches with productive fruit spurs, is inadequate to supply a dense growth of wood; often the removal of all useless wood will give a pro-

ductive tree in a couple of years. Fourth, neglect of insects and diseases, allowing these to feed and propagate unchecked. One may see plum trees with more black knots than plums; gooseberry bushes stripped of their leaves by midsummer, or the fruit coated with mildew, and apple trees starving through the attacks of bark lice. Canker and twig-blight are the diseases from which my own trees suffer most, and these are so persistent that I have been obliged to give up many varieties altogether. Hubbardston, Lyscom, Munson Sweet, Nonpareil, Primate and Yellow Bellflower were among the worst victims to canker. As some varieties are entirely exempt from this disease, I have come to the conclusion that it is chiefly constitutional with certain kinds. The opinion was given to me through the Rural New Yorker, that it was like black knot, a fungus disease, propagated through spores in the air, and that prompt excision was the only remedy.

I have nothing of recent experience to report as to success with pears in this province; with us, it is a waste of time and money to attempt to grow them, nor do I conceive, that in any part of the province, will pears ever be grown at all comparable with the same varieties as grown in Massachusetts, of which large consignments in boxes come to us weekly by steamer during the season.

At our county exhibition in 1884, a single plate of well-grown and well-ripened peaches was shown, grown in the open air in this county.

The winter of 1884 and 1885 was fatal to the buds of raspberry canes here, causing a total failure of the crop this season in all varieties, an entirely novel experience; the canes were not injured, and new growth ensued as usual. I have kept my canes much more dwarf this season, pinching off the shoots at not over four feet.

In strawberries, the Wilson continues the popular variety, supplying the market to a greater extent than all others together, but there are always enthusiasts enough in strawberry culture to give the new kinds a trial. I am not aware of a single one of these that has proved so successful as to merit a star. Fall planting is the rule with us, and by far the more successful. After the crop is off, the ground is forked over and the runners layered from vigorous young plants, one year old. By September 1st, these layered plants are strong enough to remove, and if the work is properly done, will bear a fair crop the next season. Some of our largest growers do not cover at all for winter, and affirm that this gives the best results: where the ground is covered with snow this may do, but bare ground prevails, with frequent extreme changes of temperature during all our winter months, from 50° or 60° down to a few degrees above, seldom touching zero; frequent thawing and freezing not only destroys the fruit buds, but lifts the plants out of the soil to an extent which no treading back in the spring will remedy.

A moderate success with cold graperies, in growing Black Hamburg and other choice foreign grapes adapted to them, has encouraged a considerable addition to their number within the last year, and some have been built with a view to profit only, on the supposition that the grapes can be shipped to the American markets, and will realize a fair price.

SUPPLEMENTARY REPORTS FROM NOVA SCOTIA.

Report from C. H. R. Starr, of Port Williams.

A large portion of this little Province "Away down by the sea," is eminently adapted to the growth of most fruits, indigenious to temperate climes. The apple is found to be the most remunerative fruit, and numerous orchards devoted to its culture may be seen; especially throughout that district known as the Annapolis Valley, than which, probably, a more favorable spot for the production of the apple does not exist on the face of the globe. This district, extending through Hants, Kings and Annapolis counties, includes the "Land of Evangeline," immortalized by the American "poet laureate," and traces of the old French orchards are still visible in the shape of trees, planted more than a century ago, still vigorous and producing enormous crops of natural fruit, though, in some instances, where these trees have been grafted, their power of production seems quite as great as in their natural state. These Frenchmen seem to have made very careful selection of sites for their orchards, and it is worthy of note that these very old trees are almost invariably found in deep, loamy soil.

During the last quarter century the increase of orcharding in Nova Scotia has been enormous; hundreds of thousands of young trees having been set out every year, and still the planting goes on with unabated energy, until the whole

country bids fair, comparatively speaking, to become a forest of fruit trees.

The majority of young orchards are well cared for and protected; the old-time system of turning the cattle in to prune the trees, having been pretty well abandoned.

There is, perhaps, no country where the apple is as free from insect pests as in Nova Scotia. While the canker worm, the codling moth, the borer and other enemies are known to some orchardists, others have had no occasion to contend with them, and with few exceptions, in the case of the canker worm, ordinary precautions and remedies are all that are necessary.

There are but few men in Nova Scotia who confine their attention solely to fruit raising. In most instances it is done in connection with general farming, stock raising, etc.

The farms throughout the apple district are not large; probably not exceeding an average of sixty acres, exclusive of dyked marshes. Of this acreage one eighth is computed to be in orcharding at the present time.

In the English markets, where the major portion of the crop has been sold the last few seasons, Nova Scotia apples have gained an enviable reputation for their long-keeping qualities, qualities attributable mainly to the slow maturity of the fruit, consequent upon the cool, moist nights throughout the summer months. The varieties chiefly grown are Gravenstein, Baldwin, Ribston Pippin, Nonpareil Russet, Yellow Bellefleur, Tompkins King, etc. In addition to the above may be found in nearly every orchard numerous other well-known varieties, in greater or less quantities.

The superior excellence of the Nova Scotia Gravenstein is recognized by the Germans of the United States as the nearest approach to the Gravenstein of the Fatherland, where it originated.

The apple crop last year was moderately large, but owing to the wet, cold season, was of unusually poor quality. Judging from present indications, we shall have, the present season, rather under an average crop, of very superior quality.

Pears of almost an innumerable variety have been planted, both as standards and dwarfs, the former, as a rule, proving most satisfactory. Those grafted on the quince have, in many instances, been a failure, though, when dwarfs succeed, they produce fine fruit, and in abundance.

Plums are grown to a considerable extent, but, owing to the ravages of "black knot," farmers are cautious about multiplying their stock very largely.

No other stone fruits are grown in great quantities for market, but in nearly every garden may be found specimens of cherry trees, and, in some, peaches and apricots.

Grapes, of the hardier sorts, do well in the open air, and with ordinary attention to pruning, and covering to prevent too early starting in the spring, are, as a rule, reliable croppers.

Quinces are not largely grown, but succeed well in moist soils.

The small fruits are, just now, attracting the attention of a great many of our farmers. Most of the men who embarked in the culture of the strawberry a few years ago, have succeeded admirably, finding ready markets at paying prices, not only in our own towns and cities, but in the eastern cities and watering places of the United States, where, coming, as they do, after the home supply is exhausted, they are very substantially appreciated.

Large quantities of currants, gooseberries, raspberries, blackberries, etc. have been planted the last few seasons, and the products of these will be forthcoming in due course of time, when it is hoped they may find sale in the markets of Boston and other centres, under the same favorable circumstances as does the strawberry.

A few parties are going into the culture of the cranberry, with well-merited success. This fruit, like the Nova Scotia apple, is largely marketed in England, where it finds ready sale and pays well.

The Nova Scotia Fruit Growers' Association, organized nearly a quarter of a century ago, has done good work in promoting the interests for which it was intended; and to those who labored so prominently in this connection during the earlier history of the Association, must be assigned a large share of the credit for our present status in the fruit growing world. Foremost among these stands the name of the late President, Dr. C. C. Hamilton, so well and favorably known to many of the present members of the American Pomological Society.

PICTOU COUNTY, NOVA SCOTIA—BY HECTOR M'INNES.

This county was settled by immigrants from Philadelphia who arrived in 1767. As soon as they landed they planted some apple trees and these still bear abundantly. The fruit is in shape similar to the Lady Finger, in flavor, to the Gravenstein. The next settlers were Crofters from Scotland. These did little or nothing toward fruit culture, and only within the past twenty-five years has any effort been made to plant orchards. The varieties that do best are: Gravenstein, Oldenburg, Red Astrachan, Bishop Pippin, Yellow Bellflower, Red Canada, Northern Spy, Ribston Pippin, Fall Jenetting, Baldwin, Canada Reinette, Chenango, Hubbardston and Spitzenberg.

At the Dominion exhibitions this county has been exceptionally successful as the fruit excels in size, color, and freedom from blemish. Fruit succeeds much better in the gravelly loam of the northern than in the clayey soil of the southern part of the county.

Snow Apples and Early Harvests are the only varieties attacked by fungus, and the Cabashea seems to be most troubled with the borer. Many complain that the bark on a comparatively young tree dies in patches. Many new varieties are reported to have been raised from seedlings, but the only one grown to any appreciable extent is the Favorite, by Thos. McDonald, Durham. He has thirty trees in bearing. It is an early apple, but keeps longer than the Red Astrachan.

For under-ground draining several gardeners recommend river gravel to be put in the ditch with pockets every few rods to catch any sediment.

New orchards are being planted to the extent of 10,000 trees annually. It is invariably the case where a man buys only a few trees that they are allowed to fail, but where 100 trees are set out, he has incurred sufficient expense to necessitate cultivation. Only those have succeeded who have kept the soil as fine as if it were sifted during summer; bank or sod the trees in winter, to keep the frost from the roots.

The Black Heart Cherry is being introduced with success. Plum trees are not affected by black knot to any appreciable extent.

Small fruits as yet are not extensively cultivated, but have proved satisfactory where they have been tried. The gooseberry, strawberry and raspberry plants give large returns for the labor expended.

The annual crop of apples is estimated at 26,000 bushels; other fruits 1,500 bushels. The market is good, and good apples have never been known to bring less than $1 per bushel:

NEW BRUNSWICK.

Reported by C. E. Grosvenor, of Canterbury, Chairman of Provincial Fruit Committee for New Brunswick.

The only apples that appear to do well, to any extent in this northern region, are the Russian varieties. ** Oldenburg, ** Alexander, * Red Astrachan, * Summer Harvey, * Sops of Wine, * Honey Pink, * Talman Sweet. These are grown extensively and valued about in the order named—for summer and fall fruit—while varieties, such as the Northern Golden Sweet, Nodhead, Talman Sweet; and several others have been tried and mostly swept out of existence by such a winter as last.

* Early Scarlet is a comparatively new summer variety that is gaining rapidly in favor, while the winter keeping apples that have not until lately been thought possible to grow successfully and perfect their fruit are establishing themselves in this climate beyond experiment.

** Haas, ** Wealthy, and ** Gideon have been propagated and disseminated very extensively, and wherever bearing, are proving themselves great bearers, hardy and valuable. * Fameuse, * St. Lawrence, and * Bloom should be also recognized in this class, but will, without doubt become now quite neglected.

Golden Pippin, Northern Spy, Ribston Pippin, Yellow Bellflower, Pomme Gris, and a few others have been occasionally grown, but the climate proves too rigorous for them all.

There are no obstacles to the successful growing of apples, the only insect to any extent, being the tent caterpillar, which is easily overcome.

Trees planted in rich, well prepared soil, afterwards seeded down to sod, and kept well dressed with material rich in phosphates and potash give abundant reward. Very little pruning is required if the trees are trained right when young—in a pyramidal open habit of growth—simply superfluous wood to be taken out as required.

Very little experience has yet been had in the storing or keeping of winter fruits, so little has been raised, but with low temperature, (35° to 45° Fahr.) and dry air, the summer varieties may be kept long into the winter.

Frank P. Sharp, Esq., of Woodstock, N. B., the veteran nurseryman and fruit growers, to whom I am greatly indebted in the compilation of these notes, has lately tried the experiment of shipping a few barrels of the Oldenburg to England direct by steamer. Mr. Sharp expects to have over 2,000 barrels of apples in his orchards, and reports the dissemination of trees of all kinds unabated throughout the province.

Pears and peaches are not grown, proving too tender for the climate, after many efforts that have proved abortive.

Plum growing in this section is becoming one of the features of orcharding.

Moore's Arctic, a new variety originating in Arostook County, Maine, proving very hardy and remarkably prolific in yield, has been largely propagated by Mr. Sharp, and from his comparatively small plantation of two acres he is now gathering and shipping about 4,000 peck crates of Moore's Arctic, and 1,000 of Gage, McLaughlin, Magnum Bonum, and other sorts.

This new plum, Moore's Arctic, was shown at the last sesson of the American Pomological Society in Philadelphia, by a branch in fruit, and as a preserving plum, is unexcelled here.

The secret of successful plum culture is the the laying down of the trees level with the soil on the approach of winter, the roots being trained in this form from early growth of the tree, and the tops being trained in perfectly flat or espalier style of growth by pinching and pruning in shape. Without doubt this plum, under the proper system of cultivation, will prove a great acquisition to all careful orchardists.

Strawberries continue to be grown very successfully in Clifton, Kings County, by D. P. Wetmore, and are sent in considerable quantities to the Boston as well as neighboring Provincial markets.

The old Wilson's Albany appears to be still most largely grown, and under high cultivation, and with irrigation in a dry season proves very prolific.

Sharpless, Manchester, Crescent and other varieties do well but have hardly yet been able to supplant the old Wilson. In this northern part of New Brunswick scarcely any will stand the winter unless protected by a slight covering of straw or boughs, especially in a hard winter like last.

Raspberries, backberries and other small fruits are grown to a limited extent—the leading new American varieties being imported from time time—but very little market trade being done in them. Fay's prolific currant proves remarkably well. Houghton's seedling gooseberry prove the best.

Out-of-door-grapes of all kinds have been grown, but rarely ever ripen their fruit well in this latitude on account of early frosts and shortness of season. Some of the newer kinds that I am now testing may prove better.

NEW HAMPSHIRE.

Reported by James M. Hayes, of Dover, Chairman of State Fruit Committee of New Hampshire.

Two years have made no very marked changes in the condition of fruit culture in New Hampshire. There has been a gradual increase of orchard area and products. It should be mentioned that the most perceptible advancement has been made in the culture of small fruits. Especially is this true of strawberries around our cities and large towns. I have continued the experiments mentioned in my last report with new fruits, to test their adaptation to our State. Mr. J. T. Lovett, of Little Silver, New Jersey, has kindly furnished me with the new varieties for testing. It still appears to me that the State Fruit Committee might accomplish much in thus testing new fruits, and in this way prevent the wholesale swindling which has been carried on in the interests of new and worthless fruits. The sale of the Russian Mulberry throughout the country might be mentioned as an example of how fruit growers have been imposed upon. It came recommended as a timber tree, extremely hardy and bearing a delicious fruit. None of these claims, we think, will ever be realized.

I will speak of some of our most valuable fruits.

Apples.—The same remarks that I made two years ago in relation to this fruit are as applicable to-day. No new variety has, in the least, superceded the Baldwin as a market fruit, at least in the southern portions. Of iron-clad va-

rieties I have no definite knowledge that there are any of them perfectly adapted to the cultivators of the north. The crab varieties are unworthy of cultivation, except for ornament or preserving.

Pears.—In the region in which I reside this fruit is much cultivated and produces great crops. As a consequence, when a fruitful year comes, the markets are overstocked and there is no sale for the fruit. Of varieties, the Sheldon, that gave much promise a few years since, cracks almost as badly as the Flemish Beauty in some sections. Of the Anjou too much cannot be said in praise, as it can be kept in eating order longer than any other pear with which we are acquainted. The Clapp is still regarded as one of our best pears, although somewhat subject to blight. Bartlett is good in the southern parts of the State. Keiffer, which has been so widely advertised, is not considered a first-class fruit: it may be a good cooking variety, but for desert there are many better.

Grapes.—This fruit is cultivated in almost every garden, but there are no vineyards in this part of New Hampshire. There are some in the southern part of the State in the towns bordering the Massachusetts line. New varieties have been introduced from year to year, but the Concord is still planted more than all others. Moore's Early promises well. The Pocklington we think rather late. Early Dawn, Jessica, Wyoming Red I have under cultivation, but cannot speak in regard to the fruit. The vines have not yet come into bearing.

Strawberries.—The old standards, Charles Downing, Crescent, Sharpless and Miner's Prolific, are still the best. Of the newer varieties too much cannot be said in praise of Manchester. James Vick has not done for me so well as I anticipated. Atlantic is a fair late berry. Cumberland is an excellent, large berry, well deserving trial.

Raspberries.—The Hansell and Cuthbert are two excellent berries for their season. Of the black cap varieties, the Souhegan has failed with me, while the Gregg succeeds fairly. I had a new red raspberry sent me to test, from O. A. Hill, Esq., Deering, Maine, which he has named Eastern King. It is claimed to be a cross between the native raspberry and the Franconia. The bushes are fine growers. My plants were set last spring, some of them producing a few berries, which appeared large and good. This new variety promises well, I think.

Blackberries.—Of the several varieties of this fruit that I have tested, the Snyder is by far the best for this locality. The Early Harvest kills to the ground every winter. The Kittatinny is almost as tender. The Wilson, Jr., has not been fully tested.

Peaches.—I place this fruit last on my list, as it is the most uncertain, but still fruit growers plant some trees almost every season, and in this way, when a good year comes, have some fruit.

Obstacles.—The canker worms seems to be on the increase amongst our apple orchards; and the most successful method of destroying them, we think, is spraying them with Paris green or London purple. Another obstacle (if we can call it such) to fruit growing is over-production of pears. There is a need of canning factories, or some way to dispose of this fruit, besides the local markets in the locality in which I reside. I have suggested no changes in the catalogue for our State at this time, as I know of none which I can recommend with certainty. And I will close this imperfect report, hoping that the great and good work of the American Pomological Society will continue until every farm in our country shall have an orchard.

MASSACHUSETTS.

Reported by Robert Manning, of Boston, Chairman of the State Fruit Committee for Massachusetts.

The Massachusetts State Fruit Committee recommend the following:

Apples.—Strike out Campfield, Bonum, Carolina June, Smith's Cider. ** Hunt Russet, Porter, Talman Sweet, Washington Strawberry. * Red Canada, Pumpkin Sweet, Lyman's, Primate.

Blackberries.—** Dorchester. * Kittatinny, Briton, Snyder, Taylor.

Cherries.—** Black Tartarian, Coe's Transparent, Red Jacket. * Windsor. Strike out Arch Duke.

Currants.—* Dana's Transparent, French's Transparent, Black Naples. † Fay's.

Gooseberries.—** Downing.

Grapes.—** Barry, Moore's Early, Wil-

der, Worden. * Brighton, Herbert, Martha. † Duchess, Hayes. Strike out Walter.

PEACHES.—* Foster, Alexander.

PEARS.—** Bartlett, Dana's Hovey. * Abbott, Goodale, Marie Louise, McLaughlin, Mount Vernon. Omit Amanlis, Julienne, Poiteau.

STRAWBERRIES.—** Charles Downing, Hervey Davis. * Cumberland, Hovey, Kentucky, Manchester, Miner's Prolific, Primo, Boyden.

RASPBERRIES.—** Franconi. * Caroline, Souchetti.

PLUMS.—* Bavay's Green Gage, Coe's Golden Drop, Lombard, Pond's Seedling, Smith's Orleans, Sharp's Emperor.

RHODE ISLAND.

Reported by Joseph H. Bourn, of Providence, Chairman of State Fruit Committee, of Rhode Island.

Agreeable to your request for a biennial report, I beg to communicate that the orchards and fruit gardens in Rhode Island have yielded their accustomed bounty, subject to the usual adverse conditions. Every year gives us the results of a later experience, and it is the practical, united with scientific and theoretical knowledge that the several States give to you that makes the American Pomological Society so valuable a medium in disseminating useful information over the entire country and the world.

To assist in revising the fruits for general cultivation in Rhode Island for the year 1885, I have appointed Alden B. Knapp, of Providence; Martin S. Smith, of Scituate; Dr. Timothy Newell, of Providence; Nathan D. Pierce, of Norwood, and Edward P. Taft, of Cranston; and the committee report the following changes to be made, the remainder of the list to stand as last corrected in 1883:

APPLES.—* Chenango, Saint Lawrence. † Sutton Beauty. Reject Shepard's Sweet.

GRAPES. — * Barry, Pocklington, Lady. † Early Victor, Eumelan, Martha, Vergennes.

PLUMS.—† German Prune, Prince Engelbert, Prince of Agen.

PEACHES.—† Alexander, Amsden, Foster, Large Early York, Mountain Rose.

RASPBERRIES.—* Herstine. † Hansell, Hopkins, Marlboro, Souhegan, Superb, Turner, Kimball (new.)

STRAWBERRIES.—* Parry. † Atlantic, Gypsy, Henderson, Warren. Reject Capt. Jack, Hovey.

CURRANTS.—† Fays.

Apples were abundant and good in 1884, and the varieties, Baldwin, Northern Spy and Newtown Pippin kept unusually well, late into the month of May. The McClellan, Sutton Beauty and Mother, we believe, can be successfully grown in localities where they are not known, and where their fine qualities have never been appreciated. The Mann is slow in coming into bearing; last year blossomed but did not fruit. The Baker is a popular variety, and the Chenango brings the highest price, on account of its earliness and handsome and attractive form and color. The present year promises more apples than usual in the off season, and our orchardists are now beginning to understand that good culture and a knowledge of the habits of each variety, united with systematic pruning, will enable them to derive some profit annually.

The pear trees are less afflicted with the blight than in former years, and yield good crops generally, but owing to the cold, wet summer and dry autumn of last year, did not have their peculiar characteristic flavor. The Frederick Clapp, Josephine of Malines, Henkel, Comice and Lemuel Clapp are worthy of a more extended cultivation.

Strawberries have produced about half a crop this year. The winter seemed to have affected the vitality of the plant on old garden soils, and but few fruit stems made their appearance. The soil best adapted to the strawberry in this locality is a cleared piece of woodland, full of vegetable fibres, highly fertilized, and is so retentive of moisture as to require no artificial watering. No variety of this esteemed fruit now grown has every essential merit, and new kinds must be tested in order to determine their adaptability to our soils and climate. The Parry is a new berry, fine form, color and flavor, and a good bearer. The Belmont and Jewell are sufficiently attractive as to warrant their trial as soon as the plants can be obtained. A new seedling (native), which has been named the Sawyer, has a good flavor, but will not speak of other qualities until further trial. The Henderson is early, sweet, of medium size, and not of firm flesh. The Pioneer, Duchess, Downing, Miner's Prolific, Sharpless, Manchester, Mount Vernon, Jersey Queen, Champion and

Warren are varieties that have the most salient traits adapted to the requirements of our amateurs and gardeners; while the Triple Crown, Wilder, Atlantic, Longfellow, La Constante, Hervey Davis and Duncan are high flavored, and commended to the attention of the connoisseur.

The season of 1884 was not suited to the perfection of our native grapes. Few ripened well, and nearly all wanted color and sweetness. The last winter killed both the vines and the roots of the Lady Washington and Amber Queen; while the Jefferson, Duchess, Brighton and Wilder lost much of their bearing wood and many buds. The Early Victor, Pocklington, Prentiss, Lady, Eumelan and Vergennes proved to be hardy and the Barry is always as reliable as the Concord and Hartford. The Iona on Diana wood is now promising a fine crop, and the Niagara is making vigorous growth. Some of our most successful amateurs believe that after the ground has been worked into a good condition, the best results are obtained by using stimulants, only moderately, keeping the surface soil clean and porous, and rely on nature to do the work in her own mysterious way. This year the bunches appear irregular and thin, owing probably to the imperfect development of the pollen, or to the ravages of an insect, at the time when the fruit is setting. Bagging is successfully practiced by a few, and by this method of preservation from the bees and birds, the Barry arrived at a high state of perfection last year.

Raspberries are more extensively grown at the present time, because they are profitable. For the first time the canes of the Cuthbert were killed during the last winter. The Turner and Marlboro are promising varieties and possess desirable good qualities. A native seedling (new) has been named the Kimball; a black-cap, valuable because its fruit matures at the last of the strawberry season, before the Souhegan is ripe.

The cultivation of the peach and plum in Rhode Island has grown to be an important and remunerative industry, and I have received the following communication relating to peach culture from Mr. Nathan D. Pierce, Jr., of Norwood.

"The cultivation of the peach promises soon to be an important industry in Rhode Island, as twenty thousand trees are now growing in the vicinity of the city of Providence. A large number are planted in the town of Warwick, which borders on the Narragansett bay, on a light sandy loam, underlaid with a white gravelly soil; an important element, as it affords good drainage. The roots of the peach tree are of a porous, spongy nature, and if set on moist ground, they will grow rapidly in the third and fourth years, and then die. Such trees never form fruit buds that mature fruit. Peach trees will not bear forcing with stimulating manures, even in sandy soil, as they will cause an overgrowth, and the fruit buds will drop off in the spring, when the sap starts and the buds begin to swell. The best ground for a peach orchard is a light, sandy soil, that has been planted for several years with general crops. Do not plant on ground rich enough to produce onions, beets, spinach or lettuce, for trees will be liable to make a late autumnal growth, and produce unripe wood that will be winter-killed. Spade or fork in a dressing of fine ground bone around each tree, and it would be of greater benefit to plow deep, and still better to sub-soil, so that the surface earth would work down into the sand and gravel. The fine roots would be stimulated to such a degree, as to enable the tree to better withstand the dry and hot summer. The trees should have the best care early in the season, and do not stir the ground after the middle of August, as such action would stimulate the tree to a late growth.

After the ground has been thoroughly plowed, harrowed and bushed, furrow out ten, twelve or more feet each way; the trees may be set ten feet apart, and, if properly trimmed, will not touch each other for many years. If you plant wide apart and do not prune, the trees will overbear and die about the fourth year. It is well to furrow deeply and chain off the field the other way, the distance you wish to plant. Two can place the trees in the furrows where the marks cross, and drop only dirt enough to cover the roots; hold the tree in place, scatter a handful of fine bone or commercial fertilizer on each side of the tree. Cover lightly, tread the earth around the trunk firmly, and plant between the trees one row of corn beans or potatoes, but melons and squashes are preferable, as they require thorough culture in early season. There is more danger of not setting the trees deep enough than too deep, and leave a small depression around the tree to hold the moisture.

In this climate we obtain a crop three out of

four or five years, and I have trees thirteen years old that have yielded annually for nine years, except in 1882. The borer is the worst enemy to the peach, whose eggs are deposited by a wasp-like insect on the last of May or the first of June: and if the base of the tree where it enters the ground, is examined closely in the second week of June, you will detect the eggs stuck on to the tree, which should be immediately removed. If, on examining the trees, the gum is found lying on the ground in a congealed mass, you can determine that the eggs have hatched and the larvæ entered the tree, and with a sharp-pointed knife follow the hole until you find the borer, which is a white worm, about half an inch in length. Examine the trees in the autumn before banking up, as a few may have been overlooked in the spring; for if left during the winter they sometimes completely girdle the tree. Hill up around the trees in the fall with a one-horse plough, which will not interfere with the roots if the trees are planted the proper depth. If a short whiffletree is used one can drive close to the tree without injuring the bark.

The peach tree usually comes into bearing on the fourth year, and then the trees should have a fall dressing of fine ground bone spread broadcast—fifteen hundred pounds per acre. The phosphoric acid furnished is an important nutriment. In the following autumn make application of six to ten hundred pounds of muriate of potash per acre in connection with eight to ten hundred pounds more of fine bone, applied broadcast, and turned under with a light plough. In the third year of fruiting air-slacked lime is a good stimulant at the rate of six or eight barrels per acre, spread broadcast, and worked in with the cultivator.

The varieties best adapted to this locality are Crawford's Early and Late, Oldmixon Free, Alexander, Amsden, George the Fourth, Cooledge, Large Early York, Stump the World and Mountain Rose. Twenty other varieties are on trial, and will report their value as soon as determined."

Dr. Timothy Newell, of Providence, who has studied carefully the habits of the plum, sends to me the following communication:

"During the last decade plum culture has considerably increased in Rhode Island. Previously, the cultivation of this fruit had been neglected on account of the ravages of the insect, but now the curculio is not as destructive as formerly, and this year the trees are loaded with healthy fruit. After an experience of thirteen years I have not been able to catch more than three or four insects at a time by the jarring process, and have never seen any difference as to the ravages of the insect, whether the chickens run through my orchard or not. Near my garden is a tall chimney from an iron foundry, and occasionally a dense smoke sweeps over the trees that may be obnoxious to the insect.

The black knot has never infected my plum trees, which I attribute to careful pruning and high cultivation. The rot is destructive, and but few varieties are exempt from this premature decay. A crack, an injury by the insect, contact with a branch or other fruit, which occasions retention of moisture, often gives rise to this obscure disease. The timely removal of decayed fruit will sometimes prevent its extension, and the thinning out of the fruit when half grown acts favorably in securing large and perfect fruit.

I am led to recommend the prune variety of plums for cultivation. The German prune is a vigorous grower, abundant bearer, fruit of good quality for the table, but more esteemed for preserving or drying; not liable to rot, is marketable in October at better prices than plums in their season. Prunes keep longer and do not decay like plums; and when spread on straw or mats begin to dry first at the stem, so slowly as to keep some varieties until Christmas. The Prune of Agen and Prince Englebert are the best for drying and for the table. The latter is large and delicious when fully ripe. In localities not convenient to a market, prunes are the most profitable for cultivation because less perishable; and plums must ripen on the tree, and when picked forwarded immediately to the consumer.

The Lombard is the most valuable variety of the plum in this locality, on account of its good taste, productiveness and beauty; and no other is as profitable, for the insect is not partial to this variety on account of its thick skin.

The Washington is loaded with large and handsome fruit. The McLaughlin is a vigorous grower and abundant bearer, and the fruit is not excelled by any other variety, resembling the Green Gage in appearance and flavor, ripens the earliest, and sells readily. Coe's Golden Drop

is unsurpassed as a late plum, delicious and handsome, not an abundant bearer, and a favorite of the curculio. The Imperial Gage, Yellow Egg and General Hand are good, but rot badly, while the Reine Claude de Bavay seldom matures its fruit.

A bed of sand covered with six inches of clay, upon which rests two feet of rich sandy loam, I find is a favorable soil for the plum tree; I plant my trees in a hole eight feet in diameter, three feet deep; eight inches of clay is laid on the bottom, then bring the tree to the proper depth with rich loam, set the tree, and barely cover the roots with more rich soil, add a layer of half decayed leaves, and over all throw loam and stable compost. Thus planted and dug around each autumn and spring, mulched with leaves, and often enriched with stimulating food, plum trees will not fail to grow vigorously and yield plentifully and profitably."

Too little attention is given to the preservation of winter fruit. Mr. Martin S. Smith, of Scituate, is very successful in storing and keeping apples; and I have received the following communication, giving his methods:

"In the abundant apple years, a small profit is realized from selling my crop of 3,000 bushels early. I therefore keep my late varieties until spring, when I receive a fair remuneration after paying for the picking and storing. Apples gathered in October keep better that those picked in September. Every apple should be picked singly, and deposted in a basket with the same care as you would handle eggs. In sorting, the perfect fruit only, should be packed in barrels or boxes, and placed in the cellar or storehouse at once, not to be disturbed until sent to market. Bins are not as desirable for packing in, on account of the injury to the fruit from vermin and improper ventilation. The cellar or storehouse should be kept at as even a temperature as possible, from 32° to 34°, when stored in barrels or boxes. I open the windows and doors every night and close them every day until freezing weather. I then open the same every pleasant day and close them at night. The Tompkins King and Yellow Bellflower I keep until Februrary; the Rhode Island Greening until March; the Baldwin and Newtown Pippin until May, and Roxbury Russet until June. The Northern Spy does not keep as well as the Baldwin. The Hubbardston never keeps well."

Every section of our country has obstacles to successful fruit culture. Rhode Island has the extremes of both heat and cold, and we are liable to experience a freezing degree of temperature after the buds of our trees, shrubs and vines have expanded into blossom and foliage. The laws of meteorology should be better understood by the fruit-grower; for the careful observer will find that a dissimilar range of temperature is indicated at different elevations. When the cooling influence of radiation has lowered the temperature of the surface of the earth and of near surrounding objects, the stratum of air in immediate contact will be chilled, and growing heavier, flow down into the most depressed situations and accumulate, often causing a freezing atmosphere. The importance of setting out our fruit trees and vines on elevated situations carefully selected, should receive more consideration. Located upon a moderate bluff, with a rapid descent of only a few yards into a vallew of moderate extent, trees and their fruits and blossoms will not be injured, because the cold air flows off rapidly into the adjoining depression; while in another locality, at a greater elevation in a depressed basin, surrounded by higher lands, the fruit will be destroyed by the frost's influences; for the cold air has accumulated from the adjoining slopes and descended into the valley, while on tracts of land of nearly the same level, we find but little variation. A valuable deduction made from systematic observations is, that evaporated moisture exists in the ground, and is congealed by the contact of the cold atmosphere with the earth, the plants therein are frozen, and their tissues destroyed under the influence of bright sunshine. Disappointing results of this nature occurred in this vicinity on the last of May, 1884, when a temperature of 30° was experienced. But with all these hindrances, there is a growing interest in the pursuits of pomology, but many species of fruit are not characterized by the increase of new, improved varieties, and suggests the inquiry, why so few kinds present themselves worthy of special commendation.

Original improvements, and their successive adaptations to most new conditions answer to the supernatural, and therefore remain inexplicable.

And first, to show the importance of an increased attention to the introduction of more improved varieties, let us ask whether fruits propagated by seed not crossed with another kind, run out in time, or lose their distinguishing characteristics. I think not from any inherent cause, but sometimes takes place in certain varieties, on account of increased liability to disease, or from the want of the rich stimulants they demand. They may even revert to an ancestral form; for newly originated varieties have a tendency to reversion which the propagator has to guard against by rigid selection.

Secondly, do varieties porpagated by buds and grafts necessarily deteriorate and die? The distinguished philosopher of horticulture, Andrew Knight, believed that certain varieties of some species of fruit which have been long in cultivation, cannot be made to grow in the same soils and under the same mode of management. We speak of the deterioration and failure of old varieties, but the positive evidence of vigorous trees and sound fruits is an argument that they do not wear out; and that it is only by exhaustion of the soil, incoming of disease, alteration of climate, or other natural circumstances where failure is manifest.

Again, are non-sexually propagated varieties endowed with the same power of duration unlimited, that is possessed by varieties and species propagated sexually, that is by seed. Philosophically considered, there is some limitation of the duration of non-sexually propagated forms. The principle that cross-fertilization between the individuals of a species is the plan of nature, and is practically so universal, that the inference is fairly sustained, that no bi-sexual species continually self-fertilized would continue to exist, and that trees propagated only by buds, must have a weaker hold of life than a series produced from seed.

The conclusion from a scientific point of view is, that sexually propagated varieties or races, although liable to disappear through change, need not be expected to wear out, and do not; but that non-sexually propagated kinds, though not especially liable to change, may theoretically wear out, but slowly. There is a tendency inherent in species to die out, as in individuals, and is counteracted or checked by sexual wider breeding amply secured in nature, which reinforces vitality, to such an extent, as to warrant Darwin's inference "that some unknown great good is derived from the union of individuals which have kept distinct for many generations."

Fruits are subject to physical influences, and varieties vary to a degree wider than that which separates related species The causes of variation are unknown, but under domestication is connected with excess of food, and appears stronger than in free nature. We no more know the reason why the progeny occasionally deviates from the parent, than we do, why it usually resembles it. Though the laws and conditions governing variation are known to a certain extent, those controlling inheritance are apparently not to be understood. It is not difficult to show why varieties develop so readily, and deviate so widely under domestication while they are so rare or transient in free nature where a large amount of cross-fertilization is taking place among various individuals of the same species, the tendency of which is to repress variation. Probably no organic being self-fertilizes indefinitely, and a cross with another individual must be occasionally indispensible.

In common usage, the word fruit is applied to all those parts which exhibit a striking change as the result of fertilization. Fruit is not a new plant structure; the result of fertilization is merely a physiological change in the parts. The fruit originator secures variation through the planting of seed, often cross-fertilized, and when by accident a desirable variety is obtained, this chance product is retained, disseminated and an accidental type is kept distinct.

The axiom of the fruit grower is that variation produces variation. The possibility of the production of hybrids depends on a certain relationship between the parent plants, which is manifest only in the result of sexual affinity, which is not always concurrent, as between the apple and pear, while in other cases dissimilar forms unite, as the peach with the almond. When pollen from different species is applied simultaneously to the stigma only one kind is potent, that from the species which has the greatest sexual affinity to the one that is pollinated. Hybrids show usually a tendency to the production of varieties; therefore, hybridization is one of the most important means at the command of the horticulturist for disturbing the constancy of hereditary

characters and producing varieties from two ancestral forms.

The reform in fruit nomenclature has been adopted by the State Horticultural Society, and slowly the people will become accustomed to the abbreviations. The historical signification of a variety of fruit should always be retained when a change is thought to be desirable. The Duchess of Angouleme has been given the name of Angouleme, a town in France, which transition is not natural. The pear took its name from Marie Therese Charlotte, daughter of Louis XVI. and Marie Antoinette, who was the wife of Louis Antoine de Bourbon, the Duke of Angouleme.

Duchess would have been the more appropriate appellation; besides, few pronounce Angouleme correctly.

We are now taking census statistics, and I have been successful in making "Fruits" an important item for information in the returns to be rendered in November next. We shall hope to present in the next report the aggregate extent and progress of fruit culture in Rhode Island. Is not the subject of sufficient importance for you to call the attention of the convention at its next session, and urge upon the several States the desirability of taking pomological statistics more intelligently and more accurately?

CONNECTICUT.

Reported by P. M. Augur, of Middlefield, State Pomologist.

Probably no other State is better located for markets than Connecticut—so that four hours will put our tender fruits in either New York or Boston markets.

With us a good succession of apples is Early Harvest, Red Astrachan, Summer Pippin, Gravenstein, Fall Pippin, Fameuse, Hubbardston, Rhode Island Greening, Baldwin, Roxbury Russet, American Golden Russet.

A good succession of pears is Doyenne d'Alencon, Dearborn, Rostiezer, Clapp, Bartlett, Sheldon, Onondaga, Howell, Seckel, Comice, Anjou, Winter Nelis, Dana's Hovey; and for best care, Josephine of Malines and Easter Beurre.

Peaches.—Alexander, Waterloo, Mountain Rose, Oldmixon Free, Wheatland, Wager, Crawford's Late, Stump the World, Stevens' Rareripe.

Plums.—We have suffered in some localities terribly from black knot. Varieties with us that have suffered most are Shropshire Damson, Lombard and Bavay's Green Gage. Those suffering less: German Prune, Imperial Gage, Smith's Orleans; while the Chickasaw varieties and Bassett's American have not been affected at all. The last named is diminutive in size, but profusely productive.

Quinces.—The quince is a valuable fruit, and when on a suitable soil and with good culture, is both valuable and profitable. Orange, Pear and Champion are the principal varieties in Connecticut.

Grapes.—Black—Concord, Worden, Moore's Early, Early Victor take the lead. Red—Brighton, Salem, Lindley, Vergennes. White—Lady, Martha, Duchess. Among the recent favorites are the Jefferson and Ulster, for red; Niagara, Frances B. Hayes and Pocklington, for white; Peabody, Don Juan and Downing (if reliable), for black.

Small Fruits.—The culture of the strawberry, currant and raspberry is on the increase.

The strawberry succeeds best where the ground has been heavily manured and cultivated for other crops, for a term of two or three years previously; so as to be free from the white grub.

The following is a good list of varieties: Early—May King, Old Ironclad, Crescent, Duchess, Gypsy, Duncan. Medium and late—Charles Downing, Miner, Finch, Seneca Queen, Kentucky, Mount Vernon. New varieties of great promise—Cornelia, Jewell.

For currants a good list is Red Dutch, Cherry, Versaillaise, Fay's and Lovett's Improved. The white currant should not be planted for market, as its color is not popular and it does not sell readily. For family use, when desired, the White Grape is productive and good.

Raspberries—Caps: Souhegan, Ohio, Mammoth Cluster and Gregg. Reds: Cuthbert, Reliance, Marlboro. Red caps: Shaffer; large, vigorous, productive, excellent for canning and market.

Our Fruit Committee in discussing the matter, voted that on grapes the following varieties ought to be stricken from the list: Florence, Salem, Delaware, Diana and Catawba. In strawberries, Bidwell; in raspberries, Tyler, Doolittle, Churchman's Superb and Clark.

Culture is most desirable for all fruits; to insure success with the peach and all small fruits, including the grape, it is indespensable. It might also be regarded as nearly so for the pear, while the apple often does fairly well in grass, yet not as well.

ONTARIO.

Reported by P. C. Dempsey, of Albury, Chairman of Provincial Fruit Committee for Ontario.

The most of my orchards are planted with Red Astrachan and Early Harvest for summer; Oldenburg, St. Lawrence and Colvert for autumn; Golden Russet, Northern Spy, Tompkins' King, Rhode Island Greening and Ben. Davis for winter. The climate in our province is so variable that in some sections we can grow almost any variety; in the most northern portions none but the most hardy varieties succeed. We would recommend a star for Ben. Davis, Colvert, English Russet, Pomme Gris, Wealthy, Ontario, and two stars for Golden Russet and Northern Spy.

Currants.—A star for Versaillaise.

Gooseberries.—A star for Smith's Improved.

Grapes.—A star for Champion, Herbert, Moore's Early and Worden.

Pears.—A star for Boussock, Howell, Josephine of Malines, Mount Vernon, Manning's Elizabeth, Reeder and Rostiezer.

Plums.—The Saunders has been tested in but few localities; it has proved itself more hardy than any other variety, almost free from black knot. Fruit is of full medium size; quality, best; tree very productive; season, one of the earliest. We can recommend it for trial.

We have a number of new varieties of fruit that must be tested still further before we can recommend them. The greatest obstacles in the way of fruit culture are frosts. The only remedy we know is careful selection of location where protected by elevation or large bodies of water. The remedy we use for codling moth is allowing pigs and sheep the free run of the orchard. Sometimes we spray with Paris green; more particularly for the currant.

Fruits receive more attention every year, the acreage has about doubled within the last ten years; the amount now under fruit is about 354,000 acres. The amount produced last year (1884) in bushels was about 15,330,500.

NOTES ON VARIETIES.

Chas. E. Brown, of Nova Scotia, in a letter to Secretary D. W. Beadle, of the Ontario Fruit Growers' Association, called attention to a number of what he considered valuable varieties that were not starred for Ontario. He had seen the fruit as grown in that Province, to which Mr. Beadle responds:

"Referring to the notes from C. E. Brown, Esq., I may say, Ben Davis does well about Trenton, Ont., and is there esteemed as a market apple. Canada Baldwin is on trial in Ontario, but is esteemed in Province of Quebec because of its hardiness.

Colvert is not highly valued here, quality not high, good for cooking only. Fall Jenetting is not popular, and seldom called for.

Grimes' Golden is of high quality, and does well in a large part of the Province. Esteemed for dessert. Holland Pippin has been so very badly afflicted with black spots, scabs, cracks, etc., that it is not planted now.

Mann can be grown in nearly any part of Ontario, tree hardy and productive and esteemed for its long keeping, selling well in spring. Munson Sweet but very little grown.

Newtown Spitzenberg has of late been afflicted with the black spots, and consequently is not much planted.

Northern Spy does well under high culture and careful handling. Pomme Gris is much esteemed as a dessert apple, but is seldom planted for market.

Red Canada is grown in the vicinity of Detroit River, a valuable apple; slender tree when young.

Sops of Wine seldom met with. Swaar, tree not very hardy in our sections. In warmer parts the fruit is apt to be scabby. Excellent when free from blemishes.

Westfield Seek-no-Further is superseded by better apples. Yellow Bellefleur is too shy a bearer in our climate

MICHIGAN.

Reported by Charles W. Garfield.

It is with a great deal of difficulty that we conform, even in spirit, to the wishes of the American Society as to fruit reports. Our State is full of societies, wholly or in part devoted to horticulture, and the steps of progress are discussed

so thoroughly, as they are taken, that what might be new to the report of your committee for our State, seems to us old; so please let me off with a very brief report, knowing that the meeting of the American Society, which is so soon to occur in our State, will necessarily be flooded with Michigan experience and observation.

Cranberry culture in our State is rather looking up. An excellent crop the past year upon our largest plantation (that of S. H. Comings, in Berrien county,) has stimulated interest in this fruit, and it is found that the native varieties of our marshes are admirably suited to cultivation.

The marshes of our State are in many places well stocked with the high bush huckleberry *Vaccinium corymbosum*. As the marshes become drained the bushes die out and are supplanted by other vegetation. This, together with the fact that the fruit is about as stable in price as grain, has led some of our horticulturists to question if it would not be advisable to grow this fruit under cultivation, giving some study to its habits, and thus utilize some of our Michigan swamp lands, without the usual preliminary of thorough drainage. There is no doubt in my own mind but that within a very few years we shall have cultivated blueberries in our markets, far superior to those gathered at present from our marsh land. Some isolated attempts to improve our native dewberry have not proved very successful. It is so difficult to control, and yet give it enough of its native habit to ensure immunity from the effects of frost.

Under chance cultivation I have noted in several places in our State, marked improvement in our Choke Cherry (*Prunus Virginiana*), and our Wild Black Cherry (*Prunus Serotina*.) Of the former I have seen the most favorable promises of changes for the better; the fruit being not only larger, but losing nearly all of its astringeney.

As to varieties of fruits, allow me to epitomize hastily:

The (James) Vick strawberry has disappointed nearly everybody who has tried it. The Crescent and Sharpless are rapidly growing in popularity; the color of these varieties meets popular favor. Miner (Prolific) is doing nicely everywhere. A number of parties have tried the Maggie for two seasons with exceptional success. There is an old variety, Cowing (Cowing's Seedling), that seems wonderfully adapted to the lighter soils of our State, and to me seems far better than a majority of the new sorts annually brought out. It is of large size; round, obtuse conical in form; bright crimson color; has perfect flowers and ripens with the Crescent.

In raspberries the Cuthbert is holding its own; the Gregg, where it is in favorable situations, and is not injured by frost, is very popular, but certainly lacks in quality. The Ohio is rapidly growing in favor, and in markets where quality is sought, brings the highest price of any black variety. The Shaffer is certainly a wonderful acquisition; people who began canning it in 1883 will now have no other sort for that purpose. It never can be shipped any distance, and must be handled with great care in packing and carrying to a near market. There is no raspberry grown in Michigan that approximates it in bearing qualities.

In grapes, none have come to the front so rapidly as the Worden and Niagara. There is no doubt about giving a double star to the former and a single star to the latter for Michigan. The Prentiss has proved a lamentable failure wherever tried. Moore's Early is holding its own.

One matter I wish to emphasize in this brief report. There seems to be a growing tendency in marketing small fruits to handle them in wine quarts, and this because of fraud on the part of the grower in many cases, and misapprehension on the part of consumers. The latter, in accounting for the space in each box beneath the fruit have interpreted it as an attempt on the part of producers to shorten the quart, when it was really for protection to the fruit when the boxes were piled upon each other in cases. But consumers were so imbued with the idea of attempted fraud, that they compelled those who handled the fruit to turn the berries out of the boxes and shovel them into quart measures before purchasing. It did not take dealers very long to see there was money in this operation, the margin lying between the "dry quart" bought and the "wine quart" sold. But this method could not go on always and not be noticed by the producer, who, in turn, compelled the manufacturer of his packages to narrow down the dimensions to those of a wine quart. And to day, in our State, but a small proportion of the berry boxes are honest measure. I say "honest" because fruits are measured by dry sizes. The consumer

can change all this if he will demand full measure and stop complaining until he has real cause. This short history is real and not a product of the imagination, as many might guess. We heartily endorse the action of the American Society in shortening names, and will stand by you in the most rigid enforcement of the rules, even so far as not to recognize a fruit or its originator when he persists, in using a name, in discord with the spirit of the rules. I will leave the remainder to be brought out in the discussion at our forthcoming meeting.

WISCONSIN.

Reported by J. C. Plumb, of Milton, Chairman of State Fruit Committee for Wisconsin.

The number of bearing trees of the apple, pear, plum, and cherry has been in nearly all the central and western sections of our State, reduced five to seven-tenths in number, and in some sections not one per cent. are left. This is called "winter-killing." The wet weather of late autumn was followed by excessive cold; even very hardy varieties were caught with unripened wood, chiefly near the base of the trunk, hence in a large share of the cases, examination showed that the main point of injury was within one to three feet of the ground, and from frozen sap under the bark. Thorough protection to this part would doubtless have saved most of the trees. Many have replaced the injured cambium, and will go on to yet bear for years to come. Question—Would cutting back the top in early spring have helped or retarded recovery.

The Apple.—That our whole system of apple-growing in the northwest must be greatly modified, or entirely revolutionized all must admit. Many now claim that we should give up growing for general purposes and depend upon more favored regions for our apples.

This is weakness, folly; we have in our varied climate and soil the best conditions for the production of fruit of great beauty and highest quality.

That fact was settled long ago, and is attested by our success in every exhibition where our apples are in competition with any or all the States of this latitude. We are within the "apple belt," not out of it.

We have the best home market in the world; a people who do and will consume as many apples as any other, and it is not wisdom nor economy to give up growing this fruit in every section of our State. But with the severe experience of the past year where can we look for success? In reply to this question, which comes to us almost daily. We say:

1st. Take the best of our very good Siberian crosses, and utilize all we have in that line. They not only stay with us, but give us condensed apple, in unlimited quantity of every quality and for every domestic purpose.

2d. Less certain, but hopefully sure of giving us large size and fair quality are the Russian apples, old and new; in variety, no end; with nomenclature difficult, and essential character and local adaptation uncertain to a large extent. Yet their advent is a godsend, and they and their offspring are to fill a large place in our pomology.

3d. In the multiplicity of our native seedlings which are tinctured with the blood of either or both the races mentioned, we have some that have come to stay.

The testing of these, for local or general adaptations is the work of years, and of a few only of the most persevering of our very patient toilers in this field.

4th. In the older sections of our State are yet good healthy specimen trees of many of the choice old varieties, which will remain to remind us that after all, there are some conditions of soil and culture, elevation and aspect, which when duly understood and observed, will make them safe to plant, and so they will be retained for special locations.

5th. It is not a new discovery that the hardiness and adaptation of a variety is largely enhanced by the use of a hardy stock, but the fact that a perfectly hardy variety on its own roots, needs no such help, and the increased cost of propagation by "double working," have prevented any considerable use of this method of increasing hardiness. But this method must now come in for its share of attention, and will be one of the sources of security in apple growing in the northwest.

By some or all of the means outlined above, we certainly need not fail to produce all the apples we can consume, and some for greater extremes to the north.

LIST OF FAVORITES.

Notwithstanding the discouraging view presented, our State will give two stars to Alexander, Oldenburg, Wealthy, McMahon, Wolf River, Yellow Transparent, and the Siberian Apples, Hyslop, Sweet Russet, Transcendent, Brier's Sweet, Whitney, Telfer Sweet, and others less known. We would also give one star to Baltimore, Benoni, Blue Pearmain, Bailey Sweet, Walbridge, Fall Orange, Haas, Fameuse, Golden Russet, Pewaukee, Plumb's Cider, Red Astrachan, Roman Stem, St. Lawrence, Saxton, Sops of Wine, Summer Pippin, Sweet Pear, Tetofsky, Talman's Sweet, Twenty Ounce, Utter, Willow Twig.

THE PEAR is practically out of culture except in the lake shore region. The Flemish Beauty is the only variety sought after.

PLUMS.—In the same region the choice European plums are fairly successful, while in nearly all parts of the State, only those of native origin can be relied upon, the De Sota taking the lead.

CHERRIES.—Early Richmond, Late Richmond or Kentish, the English Morello, all two stars; the Kentish only is very hardy.

GRAPES, of the Concord type are everywhere successful, the Worden taking the lead among planters. The Delaware and all the Rogers' class are especially successful where adjacent to large bodies of water. The newer varieties are being introduced with varied success. Moore's Early, Worden, Massasoit, Delaware and Concord are entitled to two stars. Agawam, Brighton, Champion, Creveling, Eumelan, Hartford, Lindley, Merrimac, Salem, Wilder, all should have one star.

RASPBERRIES.—Red and black are everywhere successful. Of the former the Cuthbert would be the leading market berry, were it a little more hardy; but with Turner and Brandywine, are all worthy of two stars. The Hansell is very promising. Of the black caps the Gregg, Mammoth Cluster, Doolittle, Tyler and Ohio have two stars. Souhegan and Shaffer promise well. The Caroline is very hardy, but too insipid.

BLACKBERRIES.—Snyder and Stone's Hardy, the only kinds at all safe without protection, and then only on the thin soil of dry hills. Ancient Briton, laid down for winter, is a superb fruit and growing in favor. Winter protection for the blackberry and grape is absolutely necessary to secure a uniform crop.

All the currants are successful with good culture and judicious use of some worm destroyer. The Victoria, Prince Albert, Late Holland and the Blacks are the only varieties which hold their foliage through the summer against the leaf blight, hence their enhanced value, especially the first named.

GOOSEBERRIES.—Downing and Houghton are everywhere successful under good culture.

STRAWBERRIES—Are the universal summer fruit, and their culture is increasing rapidly. Crescent, Wilson, Manchester, Downing, Cumberland, Miner, Glendale, Bidwell, Boyden and a dozen others are worthy of two stars for our State.

BARBERRY.—This should be included among our valuable fruits, as it is next to the cranberry in its value for tarts and pies through the entire winter. Carefully picked before over-ripe and stored in shallow trays in a cool place, they will keep well into winter; canned, with batting cover, they are as readily kept as currants, and more palatable as pie timber.

PENNSYLVANIA.

Reported by H. M. Engle, of Marietta, chairman of State Fruit Committee for Pennsylvania: In submitting the following report you will pardon me for saying that it is not an easy matter to make a thorough and reliable report of the fruits and fruit interests of a State without the aid of reliable statistics, besides active and well-informed men as sub-reporters. In this, as in most other States, the apple is the leading fruit, and since farms are being divided and sub-divided more orchards are planted, but mostly on a small scale for family use and home markets. Very few that I know of are being planted for commercial purposes, although our State has thousands of acres well adapted thereto.

The manufacturing, mining and lumbering interests seem to absorb largely the capital of our State, but we hope that more of it will be invested in fruit culture by and by, as its consumption is continually increasing. The uncertainty of the fruit crops is, of course, one of the leading causes which prevent many from planting largely.

In 1884 the apple crop was large in Eastern Pennsylvania, while in the western part it was

small. This season (1885) the western section has a full crop, while in the eastern it is almost a total failure. Peaches were medium crops in the same seasons. The pear crop this season was one of the best for many years. The grape crop in 1884 was below an average on account of lower temperature than usual.

This season the high temperature and sunshine brought grapes to as great perfection as could be expected.

Small fruits have been quite variable, no doubt according as attention had been given them. Among the many varieties of apples grown in our State, few are universally popular. Smokehouse, Winter Rambo, Fallawater, Newtown Pippin and others, once so generally popular, are no longer held in the same estimation as fall and early winter apples. Baldwin, Rhode Island Greening, Northern Spy, Hubbardston, Tompkins' King are largely grown instead. In the northwestern counties and mountainous districts they prove reliable winter apples. Ben Davis has become generally popular, and Grimes' Golden promises well where it has been fruited; York Imperial and Smith's Cider are the most popular winter apples in Eastern Pennsylvania. Among early summer apples, Early Harvest, with its fault of cracking, is mostly planted, although Primate is decidedly more valuable, and should supercede the former. Summer Rambo, Gravenstein, Porter, Maiden's Blush and Fall Pippin are popular fall apples.

Of pears the leading varieties correspond well with the list in Society's catalogue for Pennsylvania. Few new varieties have lately been introduced; the Kieffer, however, continues to be planted and discussed. Possibly no variety of fruit has been introduced in this State upon which the "Bulls and Bears" have been playing such a high game, and the contest seems to be unsettled as to its merits. However, since it has so many desirable qualities, with but one adverse, it will not likely be stricken from the catalogues for a while yet.

Quinces are very much neglected, although it is quite common to see trees on most farms, but to see orchards of them, however small, is quite rare. The orange is most common, and possibly most reliable. Rea, not generally known, is larger, but not so prolific. Comparatively few Champion have been fruited, although bearing early, and fruit of largest size; it ripens very late, and therefore requires favorable situations to mature it well in season.

Peach culture in this State will necessarily continue to be a precarious business, unless some reliable check to, or remedy for yellows, will be found. The earlier varieties are being planted more sparingly than formerly, because of their tendency to rot. Troth, Mountain Rose, Early York, Foster, Early Crawford, Oldmixon Free, Stump, Reeves, Late Crawford, Smock and Salway are the leading kinds planted. Several new late varieties have been introduced, but not generally tested.

Of plums a number of new varieties have been introduced, principally of the Chickasaw type, but few, if any, of that class seem to possess the quality which makes plums desirable. The speculation in the Wild Goose has about run its course. Lombard, Duane's Purple, Richland, Imperial Gage, Yellow Gage, Bradshaw are among the leading kinds. Were the attention given to plum culture which it deserves, it could be made a profitable business, the crops being more reliable than the peach, if the curculio is kept in check.

Cherries are grown to a limited extent, except in favorable localities. Early Richmond and English Morello among the dukes; and Governor Wood, Rockport, Yellow Spanish, Canestoga, Cumberland, Black Tartarian among the hearts and bigarreau are leading kinds. Lancaster and Ida, recently introduced, are promising varieties.

Grapes, although they are not planted extensively in our State, except in the lake shore region, yet there are comparatively few homesteads that have no grapes growing, and the many new varieties recently introduced seem to give impetus to more general planting. A good many Niagaras have been planted throughout the State at $2.00 each, and a few years hence will prove results.

Pocklington may not come up to expectations, although it has some excellent qualities it has dropped some this season. Worden is giving general satisfaction, and may supersede Concord. Brighton has many friends. Lady, as an early white grape, is worthy a place on the list; not a strong grower, but hardy. Lady Washington is very fine, but foilage subject to mildew. Ver-

gennes promises well. Prentiss is fair. Moore's Early is earlier than Worden, but the latter is much finer in bunch and fully as good quality. Duchess is winter killed. Bacchus is earlier than Clinton, but not better.

Several varieties of Rogers' Hybrids are grown, and in favorable situations and properly managed compare favorably with any other varieties. Salem, Lindley, Merrimac, Agawam, Wilder and Goethe are some of the leading varieties. The last is especially fine where it matures.

Of blackberries, Snyder and Wilson are now among the leading varieties, since Kittatinny is so subject to rust. Some of the newer varieties are slowly introduced.

Of raspberries, Cuthbert among reds and Gregg among caps seem to lead at present. Shaffer is gaining popularity. Some of the newer kinds are being tested.

Of strawberries, the new varieties are being multiplied so rapidly that it is difficult to report which are most popular, but for this State Sharpless may safely be placed at the head of the list. Crescent, Cumberland, Downing, Mt. Vernon and Wilson are leading varieties. Except for the markets of cities and large towns small fruits are not generally planted and cared for as they deserve, consequently the laboring classes in cities are better supplied with small fruits than the majority of land owners throughout the State.

The currant, with all its neglected care, supplies quite an item in small fruit consumption, but only a fraction of what it should. Fay seems to give general satisfaction, and will give new impetus to the growing of this much neglected fruit.

Diseases of fruit trees are by many very vaguely understood; for instance, yellows in peaches is attributed to the borer, and many can hardly be convinced that it is contagious, consequently little or no effort is made to prevent its spread, except by the few progressive and extensive planters. Pear blight, not so fatal as yellows, yet many trees are lost from its effects. Amputation is mostly resorted to, but too often not severe enough to save the tree. Quince trees have of late been also much affected by this disease, and the apple to some extent.

Insects injurious to fruits are, under present management, more certain than fruits, since so little is done to check their ravages. Wherever apple, pear and quinces grow, codling moth operates on the crop; while in some sections the borer is very destructive to trees. The spraying of trees with Paris green, etc., for destroying the larvæ of codling moth has been little tested.

Curculio on plum, apricot and peach, and to some extent on pear and quince, continues to occupy the field to a great extent unmolested.

I do not wish to convey the idea that little or nothing is done towards checking and eradicating destructive insects and diseases in fruits and fruit trees, but it is only the few that make efforts in the right direction, and with them it is discouraging when surrounded by neighbors who simply encourage the spreading of diseases and the multiplication of destructive insects. To F. Jackel, of Blair county; C. T. Fox, of Berks; E. H. Coelin, of Cumberland; E. P. Swift, of Alleghenny, and J. A. Herr, of Clinton, I am indebted for reports of valuable information in aid of the above.

DELAWARE.

Reported by D. S. Myer, of Bridgeville, Chairman of State Fruit Committee of Delaware.

The fruit-growing interest stands at the head of all agricultural products of Delaware. Of the different species, peaches leads them all, and the interest manifested within the past four years is so great as to exceed the former period of my recollection. In fact the demand to extend planting and culture has been so great, that nurserymen of good repute have been obliged to cancel more than one half of the orders long before the season actually begun.

The demand for best quality of peach land has advanced the price very much in Kent and Sussex counties. One of the causes for this, is the different mode of marketing now from former years. The great bulk of the peach crop used to be shipped to New York, Boston or Philadelphia and sold there by commission merchants to grocerymen consumers and shipped to other points. But now much of the crop is sold either day by day at the railroad stations to buyers from distant points, and shipped by them to their commission houses. Such points as Hartford, taking two to three car-loads a day of 500 to 600 baskets each; Elmira, one car a day; Cleveland, one to three cars; and Cincinnatti, Columbus, Scranton, even Chicago, and many other cities, taking from one to three cars a day.

The prices obtained at railway stations has averaged nearly or quite what the fruit would bring wholesale in New York, Boston or Philadelphia before any cost of freight, etc., was deducted. In fact, 80 cents to $1.25 has not been an uncommon price for a basket of prime to extra peaches at Delaware railway stations for the past two years. And 50 to 60 cents per basket, taking the orchard through all kinds of budded fruit for the whole season, the purchaser to furnish all the baskets, the grower to pick, assort and deliver in good order to buyer at railway stations. The regular sized basket holds a little over one-half bushel, or five-eighths, if well filled. Small lots of fancy fruit like Early Rivers, Reeves', Foster and large Crawfords are shipped in four-quart and six-quart baskets, packed in crates holding four to twelve, or sixteen of them, and are usually shipped by express if for Boston, or market car if for New York or Philadelphia; the prices obtained are sometimes $1.25 to $1.50 per six-quart baskets, and 50c. to $1.00 for four-quart baskets. Reeves' have been marketed wholesale at 4c. to 5c. each. The crop of peaches of 1884, and again this season was very profitable. The varieties that are bearing the best this year, are Troth's, Large Early York, Mountain Rose, Oldmixon Free, Yellow Rareripe, Stump the World and Smock. The most of all the large yellow peaches fail to bear but a very light crop, the late frosts with the exhaustion of the tree by last year's heavy crop making them fail.

Strawberries are grown quite largely at many points south of Middletown with varying success. I think the rate per quart in New York for past year's crops, 8c. to 10c.; and in Boston 12c. to 14c. per quart. Crescent has taken the lead, leaving Wilson in the back-ground.

Cumberland and Sharpless are grown to some extent, with limited amount of Bidwell and Crystal City.

The package mostly used is a 32 quart crate, hinged and hasped, with square baskets, costing about 80c. each.

Laurel, Seaford, Bridgeville and Wyoming are some of the principal shipping stations.

Blackberries, next to peaches, perhaps, take the lead. The blackberry has been planted very extensively, and no fruit-grower is considered up with the times if he has not out a good sized field of blackberries. The variety is largely the Wilson, especially in the southern part of the State, where earliness is the greatest point. Some few are testing the Early Harvest, but with such varying success as to require a few more years of trial before we can give it more than one star. My test on my grounds was beyond what I had expected. It is a strong grower, good bearer, of medium size, excellent quality, and is a very early blackberry. Kittatinny we have discarded; it is too subject to rust. Missouri Mammoth is grown quite largely, but is not entirely satisfactory, being too late. Wilson, Jr., is on trial. Some fear it is but the old Wilson over again. As the Wilson has become so badly affected with what is commonly called the rose blossom, or false blossom, we are looking for some new early blackberry of good size, and good shipping quality; hardy and free from disease.

Apples have not received anything like the attention they deserve. There is no branch of fruit growing that has paid better than the raising of choice early apples, and the demand has rather increased, than otherwise, especially for fancy early apples well-grown and carefully handled.

Red Astrachan, Early Strawberry, Early Harvest, Carolina June, Fanny, are some of the best ones.

Yellow Transparent and many other new kinds, early and late, are on trial.

There is no branch of fruit growing that has proved so unprofitable as pears. In fact thousands of dollars have been sunk where hundreds have been made. We have two great obstacles to contend with, namely: blight and slug. It is hard to find out of the two which is the most destructive. We have the Le Conte on trial now, the slugs do not appear to like it so well as the other old standard sorts.

Of grapes, the Concord was grown at one time quite largely, but it begun to rot soon after bearing the first few crops, and grape-growing was on the decline or at a standstill. We are now testing the Niagara with some promise, and Champion also; this last ripening so early, and is healthy, free of rot and productive, as to be of some value as an early market grape. Lady and Worden are showing well.

Of raspberries the Cuthbert has proved a great

improvement over the Brandywine, and is grown the most largely of all the reds. Turner and Hansell are grown to some extent for earliness. Marlboro is on trial. Superb and Crimson Beauty are not valuable for market. Souhegan is one of the best of the black caps. The raspberry crops have not been very profitable the past two years.

In growing plums, the two great obstacles we have to contend with, are late spring frosts, killing the fruit in the blossom, and the curculio. The Wild Goose is the most largely planted of any, and comes nearest being a success, but for late spring frosts. The Bradshaw is one of the best, but suffers from causes named above. There are no very extensive plum orchards. We have Golden Beauty on trial.

Apricots suffer from the same causes as named under plums, and are planted very little; in fact I doubt if all Delaware sends one hundred bushels of apricots to market a year.

Quinces are but a partial success, and are grown but for home use to a very small extent. Some large plantings have been made, but did not, as a rule, pay well.

The cherry is one of the greatly neglected fruits in Delaware, excepting the old common pie cherry or Morello, that grows wild. I have no doubt the finer kinds could be profitably cultivated, from what I have seen in a small way.

The extent of fruit growing, canning and evaporating in Delaware may call for a passing remark. The present peach crop will not fall short of two million baskets; it will not average over one-half to three-fifths of a full crop. There is no other extent of country of this size that grows so many peaches and such good ones; and grows so many berries. Fifty to eighty carloads of strawberries or blackberries per day during the height of the season, or for two weeks or more, then combined with peaches and early apples, make at least sixty to one hundred carloads per day for three months or more. Evaporating and canning are carried on at different points quite largely. The prices paid are generally good. In canning fine fruit one dollar per basket is sometimes paid. The firm of Richardson & Co., of Dover, Delaware, have a world-wide reputation. From thirty-three to fifty cents per basket is paid for peaches for evaporating.

VIRGINIA.

Reported by Franklin Davis, of Richmond, chairman of State Fruit Committee of Virginia.

In reviewing our previous reports we do not see that we can add very much in this that will be of interest or value to the fruit grower; yet the subject covers a broad and prolific field, and in going over it we hope to find something worth reporting.

The fruit crop of 1884, over a great portion of the State, was a reasonably good one, and the same may be said of that of 1885. But a severe drought after midsummer last year caused the late apples to drop prematurely, and therefore did not keep so well as usual. The same cause injured the late peaches and pears to some extent. The present season the dry weather struck us in the early part of summer, hurting the small fruit some, especially raspberries and blackberries. At this writing, the season seems favorable for apples and peaches, and they promise well.

With the wide range of territory covered by the State we have a varied climate that seldom fails to give us a good fruit crop in one section or another every year, so that the production of the different species of fruit may be counted on with probably as great certainty in Virginia as in any of the Atlantic States.

The chief obstacles to successful fruit culture are vernal frosts, pear tree blight, codling moth, apple tree borer, curculio, grape rot and mildew—quite an array of enemies to fight against, but eternal vigilance will baffle some of them. We should not expect to secure large gains without some effort on our part, and fruit culture, with proper attention, is probably as certain to bring profitable returns as any other business.

Fruit growing is unquestionably on the increase in the State. Apples are being largely planted in the middle and western division; mainly late keepers. York Imperial is rapidly coming to the front, and may yet out-rank Winesap as the most valuable late sort; the tree is a good bearer and fruit of good size, very good quality and keeps well.

Peaches—are receiving increased attention, especially in the country south and southwest from Lynchburg. That section produces fruit of superior quality, and the crop is a reasonably certain one. The plantings are largely of the

standard sorts for canning purposes. Yellow St. John is giving very great satisfaction wherever tried. It is the earliest good yellow peach we have; coming in just before Troth, its earliness, size and good quality commend it for more extensive planting. Picquett's Late, another yellow-fleshed sort of southern origin, has proved itself to be a very fine peach, and will be planted largely hereafter. Early Beatrice, though of small size, holds its own well, because of its certain bearing, attractive color, and comparative freedom from rot. Much disappointment has been occasioned by the behavior of the new, very early sorts, such as Amsden, Alexander, Bauer's Early, Waterloo, Wilder and a dozen others of the same type. They are good peaches when at their best, but are so disposed to rot just before or as soon as ripe, as to make the crop of very uncertain value to the commercial orchardist. Yet in the family orchard we would advise giving them a limited space. On high, dry ground, and in a hot, dry season, they sometimes succeed very well. We gathered from an orchard this season, on one day, thirteen of these so-called varieties, and we do not believe that the best judge of fruit could have, with any degree of certainty, separated one from another when placed together in the basket; in fact, whether on or off the tree, the size, color, time of ripening and general appearance, inside and out, was so similar that we consider it unnecessary to plant more than one of them in the same orchard.

Pears.—Among the new sorts, President Dronard may be accepted as one of very great importance, and will probably prove to be the most valuable winter variety for this latitude. The fruit is of large size and very good quality; will keep through winter. The tree is of robust growth and appears to be very hardy. Le Conte —Tree remarkably vigorous and free from disease; comes into bearing very early; fruit of good size, and very smooth, may prove a profitable market sort on account of its great productiveness and good appearance, but the quality is lacking to ensure it a place among the very good sorts. Kieffer is being planted to a considerable extent, and while the quality does not rank high, yet its productiveness and handsome appearance commend it to the commercial orchardist. This and Le Conte do not succeed on the quince. Manning's Elizabeth should be planted more extensively. The tree is hardy and very prolific, and the fruit is of excellent quality. Rutter merits more attention; it is a good autumn sort—tree an early and abundant bearer.

Cherries—Dyehouse is very promising, hardy and productive; earlier than Early Richmond, and of better quality; it will in a measure supersede that popular sort.

Japan Persimmon—The better this is known, the better it is liked; it is so wonderfully productive, and the tree as well as the fruit shows so well, that it makes an attractive object on the lawn, and is well worth planting among the ornamentals. We have seen a tree this season not three feet high, on which twenty-one persimmons of large size were matured, and another less than five feet that produced fifty-four, the smallest of which, would have measured near seven inches in circumference, although this was not one of the largest sorts. We have seen them 11¼ inches in circumference, and without seeds. The precocity of fruiting, is shown by one year old trees, having been received from Japan the last of May; set out the early part of June, and fruiting profusely the following season. If it has a fault it is its excessive productiveness; so that care should be taken to thin out the fruit as soon as set, so as to preserve the vigor of the tree, as well as to increase the size of the fruit. In the western part of the State, where the winters are too cold for the tree to stand out doors, a few can be grown in tubs and put in cellars to winter, and in this way give much satisfaction for a very little extra care. We have seen them stand out, unprotected, for several years in the vicinity of Baltimore, Maryland, and bear well, but in extreme cold winters they are liable to be injured in that latitude; but among the great variety in Japan it is hoped that some sorts may be found that will stand uninjured in any part of this State.

Grapes.—A great impetus has been given to the cultivation of this fruit, especially in Albemarle and the adjoining counties, where thousands of acres are being set out. Planting has been going on in that section to considerable extent for fifteen years or more, and the results, of course, have been encouraging, as is evidenced by the largely increased plantings of the present time. Large quantities of fruit are shipped to northern cities, and the remainder is pressed for wine. The rot is the most serious drawback to

grape culture in this region, which for the past two years has been unusually troublesome. The varieties mostly planted are Norton's Virginia, Cynthiana, Herman, Concord, Catawba, Delaware, Martha, Brighton, Lady, Ives and Clinton. Concord is still a favorite and large plantings continue to be made of it. Worden is a slight improvement on Concord in quality, and a few days earlier; it is gaining in popular favor. Moore's Early gives promise of being valuable as a very early sort; it is ten days earlier than Concord. Niagara has not been planted to any great extent, but a vineyard in Albemarle county, which was supposed to be in a good location, has shown a good deal of rot for two years past; we hope it will do better in other places. Lady is doing well and will, we think, become a favorite sort.

We recommend the following changes in marking of catalogue for Virginia:

Apples—Drop stars on Pryors Red.

Pears—Drop stars on Vicar and Glout Morceau and Rostiezer.

Apples—** Ben Davis, Bonum, Buckingham, Summer Pearmain and Early Ripe. * Carolina June, Gravenstein and Smokehouse.

Crabs—* Hyslop, Transcendent, Red and Yellow Siberian.

Peaches—** Picquett's Late, Smock Free, Crawford's Late, Oldmixon Free, Stump the World. * Beatrice.

Pears.—** Seckel, Manning's Elizabeth, Lawrence. * Rutter, Buffum, Flemish Beauty, Kingsessing, Comice. † President Dornard.

Cherries—* Dychouse.

Quinces—* Orange.

Apricots—* Large Early, Peach, Moorpark.

Japan Persimmon—* For certain localities.

Grapes—* Martha, Worden. † Moore's Early, Lady.

Gooseberries—* Downing, Houghton.

Currants—* Cherry, Red Dutch.

Strawberries—* Kentucky, Charles Downing.

We are aware of the futility of all efforts to make a general list suitable for cultivation throughout the whole State, especially of apples and grapes. The area of the State is large, and the climate as well as the soil is varied, as may be supposed when we see the eastern border washed by the waters of the Atlantic Ocean and the western limits reaching the Cumberland mountains, about four hundred miles distant; embracing within these limits the Blue Ridge and Allegheny ranges, which in some places show an elevation of over four thousand feet above the ocean. Then we have a range of about two hundred miles between the northern and southern borders of the State, which of itself gives a perceptible difference in climate, and will materially influence the character of fruits. The only feasible way we see to guide the masses in their planting, is for experimental stations to be established in different parts of the State, for the purpose of testing the adaptability and value of the different varieties; and as this is not likely to be done by individuals as thoroughly as the matter requires, we think action should be taken by the people of the State through its legislature, to establish as many stations as seem necessary for the purpose. One hundred acres or so at each station would do, and this could be bought or leased and a suitable man had to manage it at a very moderate cost, compared with the intrinsic value of such a work. Let the manager at each station submit the results of his experiments to a chief in this department, who should be located at Richmond or some other central point; then let this chief publish, from time to time, catalogues for distribution, in which those contemplating planting would have a guide as to what to plant, and what not to plant in his particular locality. We all know that the planting of unsuitable sorts is a loss of time, as well as money, and often discourages further attempts at fruit culture. The cost of maintaining these stations would not probably be one dollar to every fifty dollars that would be saved to the people by them. So, looking upon the matter as a measure of economy, and considering the increasing attention to fruit culture in the State, we insist that it deserves immediate attention by our legislators. Until some such action is taken, we would say to the fruit grower, that true progress leads us to experiment, and we earnestly recommend the trial of new sorts; but plant them in a small way until they have proved themselves worthy of more attention. Rely mainly upon the old well-tried sorts that are known to do well in your locality; then fruit growing will not be so great a lottery, but will be attended with more certainty of profitable and satisfactory results.

NORTH CAROLINA.

Reported by J. Van. Lindley, of Salem Junction, Chairman State Fruit Committee of North Carolina.

I notice there was no report made from North Carolina in 1883. This is fast becoming one of the leading fruit-growing States of the Union. We are in easy reach of our great northern and eastern cities, where a paying price is obtained for all our fine fruits at any season of the year. For our early fruits we obtain fancy prices

In the eastern portion of the State, strawberries and grapes seem to do best, they are a sure crop and are grown extensively. Peach and Wild Goose plum are also grown with profit east of the mountains.

There is no finer country than our mountain sections for apple, pear, and all winter fruits. In the middle section the heart and bigarreau cherries seem to flourish, and paying prices are realized each year; it is quite common to realize $50 from one cherry tree in one season and some trees have gone as high as $85 in a single year.

Late spring trosts are a great draw back to our peach and other fruits, and when we have two or three full fruit years in succession, the curculio becomes so plentiful that they pretty well destroy the crops; when our peach is entirely destroyed by late spring frosts, then the following year peach, plum, apricot, neetarine, etc., ripen to perfection, and not a worm or curculio to be seen. Will state here, from my knowledge of the manner and care given to fruit-growing as seen from horticultural reports and personal observation in the main fruit States of the Union, that if the same care was given to that branch in this State, it would soon be one of the leading States for fruit-growing. Not a fruit nor nut in the whole catalogue, excepting the orange, but what will succeed in some parts of the State. Our climate and soil are varied, running from the Atlantic coast six hundred miles west to the Tennessee line gives it every elevation and variety of soil, from the sandy, moist lands of the east, to the high mountain peaks of the west.

Apples.—Summer varieties: * May Yellow. * Red June. * Early Harvest. * Red Astrachan. * Large Summer Queen. * Horse. * Mother. † Autumn Strawberry. † Early Ripe.

Autumn Varieties.—** Bonum. * Buckingham. * Hays Fall. * Hunge. * Fall Orange. * Grimes' Golden.

Winter Varieties for Eastern North Carolina.—*Mattamusket. *Shockley. *Sharp's Winter. * Edwards. ** Wine Sap. * Mason's Stranger. * Ben Davis. * Hall. † Kernodle's Seedling. † McCuller's Winter.

Winter Varieties Best for Middle North Carolina. — ** Wine Sap. * Ben Davis. * Edwards. *Romanite. *Mountaineer. *Vandevere. * Nansemond Beauty. * Shockley. * Sharp's Winter. † Kernodle's Seedling. * Royal Limber Twig.

Winter Varieties Best for Western North Carolina—Mountain Section. —* Wine Sap. * Bowman's Excelsior. * Royal Limber Twig. * Queen Pippin. * Mountaineer. * Clark's Pearmain. * Nansemond Beauty. * Virginia Beauty. * Nickajack. * Albemarle Pippin. * Roxbury Russet. * Rhode Island Greening.

Some kinds appear in all three lists.

Peaches. — * Alexander. ** Waterloo. * Briggs' Red May. ** Early Rivers. * Amelia. * Mt. Rose. * Troth's Early. * Cole's Early Red. ** Lady Ingold. * Royal Kensington. ** Crawford's Early. * Stump the World. ** Chinese Cling. * Oldmixon Free. * Crawford's Late. * Oldmixon Cling. * Sallie Worrell. * Tippecanoe. * Lady Palmerston. * Heath Cling. * Eaton's Gold. † Levy's Late. * Albright's Cling.

Pears. — * Doyenne d'Ete. * Giffard. * Brandywine. * Clapp. * S. du Congress. * Kirtland. * Angouleme. * Bordeaux. * Le Conte. † Comet or Lawson. * Kiefler.

Blight has shown this year only on Brandywine and Kiefler. I have two seedling pears of great promise, I have named one Beaufort and the other Lucy Duke. Miss Duke raised both from the seed of a pear from California. They are from Beaufort County, North Carolina. The Lucy Duke is about the size and shape of the Bartlett, but is a bright golden russet color, and of the finest quality; ripens here in September. The Beaufort, named from the county in which it originated, resembles Winter Nelis in shape and color, but about twice the size; it ripens late in October, one month later than Winter Nelis; quality one of the best; from the appearance of the fruit and growth of trees, they must be seedlings of Winter Nelis crossed with Bartlett.

Will send you specimens if I can get them. There are only the original trees now bearing, and they are two hundred miles east of me.

CHERRIES.—In the eastern section of the State, hearts and bigarreaus will not do well, but the dukes and morellos succeed in most all parts. The list given is for the middle and western part of the State.

* Dr. Wiseman (believed to be the Doctor Cherry introduced by Dr. Kirtland). ** Early Purple. ** Black Tartarian. * Knight's Early Black. * Great Bigarreau. ** Napoleon. * Rockport. * Gov. Wood. * Florence.

PLUMS.—** Wild Goose. * German Prune. * Reine Claude. * Coe's Golden Drop. * Blue Gage. * Shropshire Damson.

Japanese Persimmon does well in Eastern North Carolina; it is only a little hardier than the fig; with slight winter protection it will do well in the middle portions of the State.

Black English and White Everbearing mulberries are largely planted for stock and poultry.

Figs do well in the east, and if protected in winter will do well in the middle part of the State.

GRAPES. — * Moore's Early. ** Worden. ** Concord. * Ives. * Hartford. * Perkins. * Champion. * Prentiss. * Lindley. * Delaware. * Salem * Lady. * Martha. ** Brighton. * Goethe. * Norton's Virginia. * Wilder. † Lady Washington. * Pocklington. † Niagara. ** Scuppernong (for Eastern North Carolina).

APRICOTS. — * Early Golden. * Royal. * Hemskirk. * Orange. * Turkey.

NECTARINES.—* Southern Queen. * Early Violet. * Stanwick. * Prince's Golden. * Boston. † Kirkman's Mammoth.

QUINCES.—* Orange. † Champion.

FIGS. — * Brunswick. * Brown Turkey. * White Marseilles. * White Genoa. * White Celestial.

STRAWBERRIES. — ** Sharpless. ** Wilson. * Newman's. * Crescent. * Bidwell. * Longfellow. * Miner's Prolific.

RASPBERRIES. — ** Cuthbert. * Caroline. * Gregg.

CURRANTS. — * Red Dutch. * Red Grape. * Black Naples.

GOOSEBERRIES.—* Houghton. * Smith's.

BLACKBERRIES.—Better ones grow wild than any cultivated.

English Walnuts, Chestnuts, Pecans, etc., do well in most parts of the State.

KENTUCKY.

Reported by W. A. Huggins, of Cave City, Chairman of State Fruit Committee of Kentucky.

The year 1884 was a poor one for fruit in Kentucky; the peach and plum crops were almost entire failures; apples and pears in some sections of the State were very fine, but these crops were not generally good. Much of the fruit was very inferior. Like the apple and pear, the small fruits in some localities did well.

This year (1885) there seems to be no partiality shown in Kentucky as to location, but the fruit crop of all kinds, so far as I have been able to ascertain, has been general throughout the State, and the fruit of the different classes was very fine in quality, except peaches, and these were very inferior in both size and quality.

For marketing, the Wild Goose plum and the strawberry seem to be the most popular and profitable fruits for this latitude. They are both so hardy and productive that they rarely fail to produce good crops, and they ripen at a time when fruit is scarce and in demand, and they meet with quick sales and bring remunerative prices.

I have no reason to change the list for general cultivation given in my former reports. However, for the hardiness and productiveness of the trees, and the combined good qualities of the of the fruit for both home use and for market, I would recommend that the Red Astrachan and the Pennsylvania Red Streak be added to the Kentucky list. The Kieffer pear is bearing here. There is certainly a bright future for this pear. The Le Conte has never born in this State, to my knowledge. Blight has greatly damaged the pear trees for the last two seasons. A similar disease has affected the apple trees, though I have not known any killed by it. Rust has attacked some of our old, reliable varieties of strawberries. The peach has too many enemies to be counted profitable, hence only in favored localities is this fine fruit receiving attention. The cherry and the currant may also be classed with the unprofitable fruits.

For shipping purposes, barrels are preferred for apples; boxes, holding from one-fourth to

one-third of a bushel, are preferred for plums, peaches and pears; quart boxes, placed in crates, for the small fruits.

IOWA.

Reported by G. B. Brackett, of Denmark, Chairman of State Fruit Committee of Iowa.

In my last report I gave you some account of the damage done to our fruit trees by the trying winter of 1882 and 1883. I was then in hopes we had seen the worst of it, but I am sorry to have to report still further injury by the severe winter following, in which the damage already so apparent was greatly increased, and in some parts of the State a large share of the old orchards were killed, or so badly damaged as to be past recovery.

But this was not all. The past winter, 1884 and 1885 was one of the severest ever known in the history of the State, thus giving us three very cold winters in succession, the like of which has scarcely ever been known. In the eastern central and northern part of the State, there is scarcely a healthy orchard left, while in the southwestern part they seem to have escaped this wholesale destruction. In my travels over the State last fall to collect fruits for the New Orleans Exposition, I found in that section greatly to my surprize, the orchards in good condition and bearing heavy crops of as fine fruit as ever grew. Had it not been for this fact, our horticultural society would not have taken the highest prize over the other northern States, and very strange to say, those orchards, I am informed, are again this year loaded down with fruit; something quite unusual for trees to bear two heavy crops in succession, and showing that they must be in a healthy condition. Now, why it is that this section of our State has escaped from the damage done in other parts is a problem for the horticulturist to solve. The degree of cold was fully as great as in other parts, showing plainly that it is not the extreme cold alone that does the work, but that other causes have their effect. Evidently the soil has much to do with it in this case. The geological formation is quite different from the eastern part of the State, there being no hard-pan or stiff clay sub-soil, but a loose porous formation that admits of good drainage. In this soil the Rambo, Maiden's Blush and other tender varieties have gone through these test winters unharmed, and are bearing heavily this year. The Grimes' Golden still holds its reputation as one of our best sorts. The Anjou pear is the hardiest of all the varieties yet tested in this climate, and is less subject to blight than any other kind. The boasted blight proof Kieffer has blighted badly the past two years.

Several new varieties of apples are on trial here, but none of them sufficiently tested, yet, to be placed on our lists for general cultivation. The Newport, spoken of in my last report which originated in this State I think is worthy of trial in other States.

With the present unsettled climatic conditions, I do not deem it best to recommend in this report any material change in the catalogue of fruits, but wait for further developments. If it is true that history repeats itself, it will be a long time before we shall have the same climatic conditions which we have just passed through, and if we have reached the climax of cold we may look for more genial weather and brighter prospects for the pomologist.

Small fruits are much more extensively used than formerly, and consequently summer apples less used. Commencing with the strawberry and following up with the hardy varieties of raspberries, blackberries and grapes, the small fruit crop is now considered an assured success, and the fruits are now so cheap as to come within the reach of all. Our State horticultural society has established twelve experimental stations in different parts of the State where all kinds of new fruits are to be tested, and experimentation in the production of new fruits is to be carried on, and we hope in the course of time to arrive at some good results. The question of hardiness is now of the greatest importance to the northwest, and all effort for the introduction of new fruits will be made with this question as the chief object.

MISSOURI.

Reported by S. M. Tracy, of Columbia, Chairman State Fruit Committee of Missouri.

There is but little new to be added to what has already been said for Missouri. In reply to your questions of June:

1. Apples; peaches in the southern portion of the State; plums, cherries, raspberries, strawberries and grapes.

2. As revised by leading members of our State

Horticultural Society in different sections of the State, the fruit list should be changed as follows:

[Here follows a list of recommended changes which have been made in the catalogue.]

3. We have a new raspberry, "Hopkins,"—extra fine and profitable; hardy and productive; originated by G. W. Hopkins, Kansas City, Missouri. A new apple, "Gano," from W. G. Gano, Parkville, Missouri. Another, "Rankins," from H. C. Kirshbaum, Tolona, Missouri. Another, "Loy," from E. F. Hynes, West Plains, Missouri. Another, "Shackleford," from Frank Harlan, Canton, Missouri. These all give exceeding promise as being very valuable for our State, and this year will prove it better. The Loy took the premium as the best new apple at the World's Fair. The Rankins took the premium as best at our State Society, the Loy not competing. A new grape, "Marsala," Labrusca, vine very vigorous and free from mildew, fruit as large as Goethe, red, has been grown here eight years, and is less inclined to rot than any other we have; it is very productive, fruit of fair quality for table, and very fine for wine.

4. Our State and local societies have adopted the rules for nomenclature, adopted by the American Pomological Society, and we are endeavoring with fair success to secure uniformity of names.

6. Cultivate until trees begin to bear, then keep in clover, to be plowed under whenever the trees fail to make sufficient growth. Our fruit growers are becoming less and less in favor of anything like severe pruning.

KANSAS.

Reported by Geo. C. Brackett, of Lawrence, Chairman of State Fruit Committee of Kansas.

It affords me pleasure to be able to respond to your circular asking information regarding the pomology of Kansas, which must be brief from lack of time which is required to perform my other duties to the State.

Following the lines marked out in your circular will hardly be advisable in this instance, as but very little, if any, new developments have occurred since my last report upon the points therein named. But to strengthen the statements heretofore made regarding the productions of this "far-off desert land," I will state that all species of fruit common to the United States are successfully grown. The apple, pear, plum, cherry, grape and all classes of small fruits, succeed and yield most bountifully in every portion where planted. The early planted orchards even to the 100th meridian westward have come into fruiting, and the product is remarkably well developed and free from attacks of insects and other injurious agencies. The coloring of these orchard fruits is exceptionally fine, and the texture good.

We have now a continuous line of fruit-producing territory, reaching from the eastern border across the State to the 100th meridian, and covering a large portion of what is known as the "Treeless Plains."

The progress of this work has been remarkably rapid, and I might say, without a parallel in the settlement of any other State. The year of 1855 witnessed the planting of the first fruit orchard in this State, outside of the Indian Missions, and to-day we are able to present the following statistics to prove the energy and intelligence guiding the efforts to establish an industry so highly valued by our people.

STATISTICS.

Number of trees in bearing March 1, 1884:	
Apple	3,665,000.
Cherry	862,471.
Peach	5,804,070.
Pear	104,638.
Plum	314,526.
Not in bearing:	
Apple	4,045,472.
Cherry	713,886.
Peach	4,755,071.
Pear	202,812.
Plum	311,027.
Small fruits—acres of—	
Blackberry	2,889.
Raspberry	3,132.
Strawberry	1,233.
Acres in vineyards	4,421.
Acres in nurseries	7,539.
FRUIT CROP IN 1884—100 REPRESENTING A FULL CROP.	
Apples	66 per cent.
Peaches	13 " "
Pears	50 " "
Plums	45 " "
Grapes	85 " "
For 1885:	
Apples	55 per cent.
Cherries	59 " "
Peaches	10 " "
Pears	53 " "
Plums	40 " "
Quinces	20 " "

Blackberries	49	"	"
Currants	46	"	"
Gooseberries	58	"	"
Raspberries	65	"	"
Strawberries	68	"	"
Grapes	88	"	"

The peach is a success only in the southern tier of counties, or below the 38th parallel of latitude. In that belt it becomes generally productive, yielding an abundant crop.

As to "new native varieties," but little can be said, as time is required to give them a proper test. But to the few named in my last report, I desire to add the "Fraker," which promises to excel most of our winter sorts of apples, especially as it combines a beautiful high color, with good form and flavor, and is a late keeper, having held over in good flavor, and sound condition this year until the 20th of May without any special care or treatment.

Of the Russian varieties of fruit very little encouragement for their planting in this State can be given. In fact we do not need them, and the effort being made by nurserymen in other States to urge them on to the uninformed people of the State is regarded as a swindling scheme. No valuable consideration being given for the money asked. The Russian apricot, first planted by the Mennonites in the western counties, has some merit.

During a recent visit to such settlements, I found the trees to be healthy and well laden with fruit. Some of which was very inferior, scabby and of poor quality. Others were much better in every respect, and I believe worthy of propagation and culture. But that they are so remarkable a fruit as some of our nurserymen extol them to be, I cannot concur. I am convinced from my observations that the tree is hardy and productive, and like the plum, could be profitably grown, if means were applied to prevent the attacks of the plum curculio and gouger. But will the planter do it? If not, then it is a very poor investment to put money into their culture, and especially so, at the extravagant prices asked, 50c. to $1.50 per tree, when the actual cost of growing does not exceed five cents per tree. But some nurserymen must always present some speciality to their customers, and like showmen, the more wonderful the placard, the better it wins with the masses.

If curculio attacks can be prevented with this apricot, the same method would protect our peaches and plums, and in these there would be much greater profit than in this foreign fruit.

Since the claim of the propagators of this fruit, viz., that it is curculio proof, has been exploded, another dodge has been made by asserting that there are two classes of this apricot, viz.: The plum apricot, which is injured by insects, and the peach apricot which is not. What bosh! Anything to get the people's money. I have had both the large and small, or the so-called plum and peach varieties, and can discover no difference respecting their liability to attacks of the curculio. But some nurserymen take advantage of the ignorance of their customers. If the people were well informed as to the nature of plants and insects preying upon them, efforts of this character would fail, and none but honest men would be found engaging in the nursery business.

Nomenclature.—Your society has commenced a commendable as well as highly valuable work in its efforts to correct the confusion which exists to a great extent throughout the land. But so long as nursery men are unscrupulous in the traffic of trees, as to disseminate varieties in almost any name that the custom calls for, I fear that the progress made in this line will be very slow, as one nurseryman can produce more confusion in one year than can be set aright in ten.

To illustrate: There is a firm in Nebraska which makes the Russian Apricot a specialty. It claims to have given a great deal of time and expense to the selection of choice and desirable varieties, which they have named: Gibb, Alexander, Nicholas, Alexis, Catharine and J. L. Budd, and are propagating them by buds and grafts. This effort, if honestly conducted, would establish a reliable nomenclature of that fruit. But a prominent County Horticultural Society in this State, led by nurserymen, not to be outdone, has announced another list, having a contempt for foreign names, in pure Anglo-Saxon. A committee was charged with the work, and reported as follows: To the Russian Apricots we would recommend that the following names be given: Evatt, in honor of the President; Greisa, Vice President; Smith (not John), the Secretary; Byram, a visitor at the meeting. Upon investigation it was found that the particular sorts to which these names should be attached, had not yet been selected, as none of these notables had any

trees in fruiting The names were made ready for the kinds whenever found. Now as the Russians claim that this fruit reproduces from seed, it is possible that the varieties may, in part at least, be duplicated in tree, and the Alexander may be the same as the Evatt, or the Smith the same as the Alexis. It is by such work of a set of money-craving schemers that the noble work of your Society becomes frustrated.

[At this point Mr. Brackett recommends changes in the fruit catalogue for his State, which have been made by the Committee on Catalogue.]

The Mrs. Garfield strawberry has fruited this year (1885) for the first time; plants were set in 1884. So far, the plant has been very healthy and vigorous, enduring our hot weather without any appearance of injury. The berry was uniformly large, well formed, very attractive, quality rather better than the Crescent. But no variety possessed their usual quality, owing to heavy rains, probably, during the ripening season.

COLORADO.

Reported by D. S. Grimes, of Denver, Chairman of State Fruit Committee of Colorado.

In regard to varieties of fruit recommended, we have no changes to make in our former report, except to add to our apple list Wolf River with two stars.

In fruit tree planting we note an annual increase of from ten to fifteen per cent. Small fruit culture, on account of early returns, takes precedence to such an extent as to cause a serious neglect in the planting of the more durable and valuable standard fruits. This mania for small fruit growing in Colorado is already being felt on our markets, resulting in low prices and discouraged producers.

Strawberry culture, although chiefly confined to Denver and the valley towns, can by following up the high altitudes of the Rocky Mountains, be made to extend through August.

To determine what influence the soil, altitude and latitude has in time of ripening this delicious fruit, I have solicited and received from strawberry growers in various parts of the State information which will be of interest to both growers and consumers.

From the correspondence received I extract the following data – adding the altitude of each locality:

Rocky Ford—Altitude, 4,223 feet; first strawberries, May 20th; soil, sandy loam; reported by L. Hartig.

Grand Junction—Altitude, 4,500 feet; May 25th; sandy river bottom land; variety, Wilson; reported and raised by Robert A. Orr.

Canon City—Altitude, 5,376 feet; June 1; soil, sandy loam; variety, Crescent; reported and raised by John Gravestock.

Denver—Altitude, 5,197 feet; June 4; variety, Crescent; soil, sandy loam; reported and raised by F. E. Bird.

Boulder—Altitude, 5,184 feet; June 5; variety, Crescent; soil, sandy; raised by G. W Rust; reported by William Newland.

Greeley—Altitude, 4,779 feet; June 6; variety, Crescent and Wilson; soil, sandy; reported by A. E. Gipson.

Fort Collins—Altitude, 4,966 feet; June 9; variety, Crescent; reported and raised by J. S. McCleland.

Ouray—Altitude, 7,640 feet; June 15; reported by Montroro Messenger.

Buena Vista—Altitude, 8,000 feet; July 1; variety, Wilson; soil, sandy; reported and raised by Alex. G. Watson.

Del Norte—Altitude, 7,743 feet; July 4; variety, Crescent; soil, sandy; raised and reported by R. C. Nesbit.

Gunnison City—Altitude, 7,500 feet; August 4; variety, Kentucky; raised and reported by T. Grassmuck, M. D.

The dates here given, extending from May 20 to August 4, and in altitudes ranging from 4,223 feet to 8,000 feet, furnish the best evidence of the extended periods of the ripening of the same varieties of strawberries, or in fact, for all kinds of fruits and vegetable productions, from the plains to high mountain elevations.

A clay soil, with late varieties of strawberries, will extend the season two or three weeks longer, thus supplying our market with home-grown fruit at least three months. Colonel Watson, of Buena Vista, and Mr. Nesbit, of Del Norte, claim that strawberries grown by them on those high elevations are remarkable in large size and delicious in flavor.

Buena Vista, although higher in altitude and latitude than her alpine competitor, Del Norte, not only comes in four days sooner, but fruit trees planted there seem to stand the racket of

Arctic extremes even better than at Denver and Greeley.

While our average altitude seems to increase the size of strawberries, it has the contrary effect on standard fruits.

It must be understood that irrigation is an indispensible element in our horticulture. In the spring, while the water is as cold as ice from the melting snows of the mountains, all vegetation is somewhat checked and held back by our system of irrigation. In the mountains the water is always cold. For several years we have been sending a variety of all kinds of fruit to be tested in those alpine regions, and hope at the next meeting of the American Pomological Society, to give a more extended report of fruit-culture above the clouds.

CALIFORNIA.

Reported by Dr. John Strentzel, of Martinez, Chairman of State Fruit Committee of California.

A retrospect of my former reports admonishes me to avoid repetition, leaving ample room to state facts as disclosed by the rapid evolution of Horticultural Science in California.

The most earnest attention continued in selecting the very best of marketable fruit of commercial value, has given impetus to efforts in raising improved varieties from seed, and by hybridization considerable success has been achieved with peaches, almonds, cherries, etc.

A choice cling peach originated in Contra, Costa County, by Mrs. Sellers, of Antioch, is a yellow, globular, beautifully colored fruit of delicious flavor, combining many valuable qualities. The "Muir," a yellow free-stone, is a general favorite; and innumerable seedlings scattered all over California, unknown to fame, but really of great merit and highly prized by their sponsors, offer unusual facilities to propagate the best.

Seedling almonds of choice quality raised by A. T. Hatch, of Solano, and others, are superseding the old Languedoc, an unsuitable variety once extensively planted, which caused the almond culture to fall into disrepute.

The Centennial cherry, a seedling lately brought to marked notice by Coates & Tool, of Napa, resembles the "Graffion;" its apparent keeping quality greatly increased by intelligent care in wrapping the specimens and packing in cotton wool, incidentally furnishes a lesson concerning the disposal of our early cherries, how to pack for distant transmission, and brings to our mind the trade in cherries as carried on in Europe, near Hamburg and distant provinces of Russia—their methods to be improved by us, and carried out on a grand scale. The large white varieties are now preferred for canning.

The depredations of the codling moth and woolly aphis have checked for the present the extension of apple orchards, still a single grower is filling a contract for 15,000 boxes for Australia.

Pears.—Enormous numbers of trees were planted during the last two seasons, mainly Bartlett, Clairgeau, Winter Nelis.

Apricot and plum trees are growing for an estimated crop of 500,000 tons.

Figs.—Numerous foreign varieties are on trial.

Japanese Persimmons bear well, but the fruit is rather insipid.

By proper selection of the seed of the English Walnut, a great improvement in the quality and earlier bearing are secured; the "Preparturiens" transplanted to our virgin soil, loses its dwarfing, and becomes a rampant grower and negligent bearer.

The Pecan, Chestnut, Black Walnut, English Filbert make a thrifty growth, and ignorance of their merits can only be accounted for by their tardy dissemination.

The success in making choice olive oil, renders an olive grove one of the most desirable of popular investments.

Small fruits are raised in abundance.

The tropical waste along the Colorado bottoms at the junction of the Gila river begins to be experimented on for the growth of Bananas, Pineapples, and Coffee trees; thus from year to year new sources of industry for our State are multiplied, and the wonderful peculiarities of the climate appreciated and utilized.

To what extent the fruit production can be profitably increased, and new distributing markets established, is shown by the success of California orange growers, who, favored by the reduction in railroad freights, succeeded in marketing to good advantage a great crop of citrus fruits distributing about sixty-five millions. In competition with foreign countries at the New

Orleans fair, California oranges gained the premium.

Our raisin crop promises an unprecedented increase this season, with hope of a remunerative price, the profits heretofore having been eaten up by the high price of labor and freights. It should be impressed upon our legislators not to discard the incidental protection of the present tariff, which is indispensible to sustain said industry under the present conditions.

The extension of our vineyards is beyond the necessities of the hour, and the great capital required to provide storage room and accessories, will be oppressively felt by the small vineyardist. Our security from failure must be sought in the experience of old vine growers in our midst; our persistent desire to plant the best varieties of grapes, suitable for table, raisins or wine making, and adapt European processes to our conditions; improve where possible on costly and laborious lessons by close studies in experimental chemistry now conducted at the College of Agriculture, regarding fermentation in all its phases. Recent discoveries in this field of science, abrogating the empirical proceedings of ages—thus equalizing somewhat the status of new beginners.

With the multiplication of fruit varieties introduced here, the obstacles to successful culture rapidly increase. A catalogue of all the insect pests would be quite lengthy—fungoid diseases, depredations by the rodentia—require almost superhuman industry and costly efforts to keep them in bounds. Phylloxera is also known, but we are comforted that the curculio has let us alone, so far apparently assigning to diabroticas the gardens of California. Thus, in the pursuit of a most noble avocation and peaceful walk in life, we are forced to constant warfare with the trespassers. Through the active co-operation of leading fruit growers, a favorable recognition of this industry was made in our Legislature by organizing a State Board of Horticultural and Viticultural Commissioners, with a moderate subsidy to keep them going, and judicious enactment to compel, by law, negligent orchardists to destroy the insect pests on their premises. The labors of said Commissioners, Fruit Growers' Conventions and State Horticultural Society, as embodied in ample circulars and reports, covering experience of fruit growers all over the State, with valuable and minute directions for destroying insect pests, and supplemented yearly by the entomological researches, through the Agricultural Department, furnish growers the facilities of instruction in all the branches of horticulture. If those teachings are not acted upon, or not appreciated by many, the blame must rest with themselves; and it would be superfluous to repeat the recipes, beyond making simple deductions upon controverted points of the qualities of insecticides. Thus, in the use of coal oil some damage was inflicted on trees, caused, mainly, by using crude oil improperly or imperfectly saponified, whereas rectified kerosene, owing to its rapid vaporization, diluted with water and finely sprayed, does no injury to vegetation, and its emulsions or mixtures with sour milk or lye, additions of sulphur and pyrethrum, are the most effective in destroying the annoying family of scales and aphides. Fungoid growths yield to to the potent washes of sulphate of iron; alkalies, sulphides and lime to be applied, sufficiently diluted, and when the plants are in a dormant state, no injury need be apprehended.

To keep the ground well drained, free of weeds, cultivated and pulverized thoroughly—the trees well fed—is a self-evident necessity and has to be supplemented by judicious pruning and thinning of super-abundant fruit.

A reduction in overland freight to a uniform rate of one and a half to two cents, with extending facilities for shipping by the carload from way-stations, as practiced in forwarding other produce, would give a wonderful impetus to fruit culture in California, and be a benefaction to all concerned, as the risk upon perishable goods is borne by the shippers; and this way-traffic is the very thing desired to sustain a railroad, and would be the greatest incentive toward the settlement of railroad lands and all others. It is hoped that the managers of said public carriers will be induced to work in the interest of of the stockholders, by inaugurating the better system, and organizing details in time for the next fruit season.

GEORGIA.

Reported by Samuel H. Rumph, of Marshallville, Chairman of State Fruit Committee of Georgia.

Growing fruits for market is fast becoming a business of great importance in this State, and hundreds of thousands of fruit trees have been

planted within the past two years. Our climate and soil is so varied that we can grow most of the hardy fruits to perfection, and in the extreme southern portion of the State we can even grow some of the tropical fruits, such as bananas, oranges, etc., to a limited degree, with but little or no protection during winter.

Southern Georgia (where it originated) is also noted for her fine Le Conte pear orchards, and this pear is planted almost to the exclusion of all other fruits for market.

Among the mountains of North Georgia the apple and grape do remarkably well, and this section is noted for the extreme longevity of the tree and vine; also keeping qualities of the fruit. While in Middle Georgia the peach attains the highest degree of perfection, and thousands of acres are now being planted to this fruit, with the view of shipping to market, both in its fresh and evaporated state. This is certainly the fruit belt of the State, as the apple, pear, peach, plum, fig, grape, raspberry, strawberry, etc., all thrive and bear regular and abundant crops.

The apple crop was never larger and finer all over the State, and our home markets will be well supplied with home-grown apples this winter. A few years ago it was a rare sight to see Georgia apples in market as late in the season as January first, but now we keep them in our cellars all winter, and have old ones on hand when the new crop ripens. To show you the interest that is being manifested in this fruit, one grower in Houston county, has planted within the last few years over twelve thousand apple trees in orchards. The following is a list of twelve varieties which are largely planted for market: Red Astrachan, Early Harvest, Red June, Simmon's Red, Horse, Carter's Blue, Shockley, Equinetetee, Mangum, Stevenson's Winter, Yates and Ben Davis.

Pears have matured a good crop this year, and the large orchards of Le Conte pears planted in the southern portion of the State, are now coming into bearing; and thousands of bushels of fruit have been shipped and evaporated this season. All of the Japan and Chinese pears that have been tested seem to do well, and but little blight has been reported so far.

Peaches promised an abundant crop early in the season, but the excessive rains that commenced the latter part of May and have continued up to the present, have blighted the hopes of the growers to a great extent, as the fruit rotted badly just before ripening, and the most of the shipments to the northern markets were received in bad order, hence low prices. And with the exception of a few weeks' shipments during the month of July the growers have realized but little or no profit from their shipments of peaches. Never before have we witnessed such destruction of fruit by wet weather. Still, the growers are not at all discouraged, and from the present indications we will have more young trees planted in orchards this winter than any previous year.

Among plums the Wild Goose is more extensively cultivated for market than any other variety. Some growers having ten to fifteen thousand trees planted in orchards; and although the crop was two to three weeks later than usual in ripening, on account of backward spring, they bore an immense crop of large fine fruits, which was generally reported as being received in market in an excellent condition, and sold at fair prices.

Grapes rotted badly in some vineyards, while in others, only a few miles distant, they matured a good average crop of perfect fruit. The Ives, Concord and Delaware are grown largely for market in Northern and Middle Georgia.

Of Raspberries the old native black cap is generally cultivated to a limited extent all over the State, but the improved varieties seem to succeed best in Northern and Middle Georgia; where the Cuthbert is planted extensively, and so far has proved to be the most profitable market variety, and where kept free from weeds and well cultivated, it stands our long, dry summers better than the old native black cap.

Strawberries were three to four weeks late in ripening, but the crop was above an average, both as to quality and quantity. This fruit can be successfully grown in almost every section of the State, and it is fast growing in favor for market. In Southern Georgia they begin ripening in March and continue in bearing through the State until July. Wilson and Sharpless are the most popular varieties for shipping.

ALABAMA.

Reported by J. S. Newman, of Auburn, Chairman State Fruit Committee of Alabama.

I regret that I must report very little systematic attention bestowed upon fruit-culture in

this State. Experiments will be commenced at two experiments stations next winter in which systematic and scientific inquiry will be made as to varieties, manures, cultivation, pruning, etc.

Large plantings of the Le Conte pear are being made in the southern half of the State. The trees grow most vigorously and bear abundantly, especially in the orange sand region. No blight has appeared upon this variety as yet.

Grape-culture and wine making have been successfully prosecuted in different parts of the State, and especially in the vicinity of Cullman, settled by a colony of Germans. A recent visit to this locality revealed the following facts: The Scuppernong, Concord, Ives and Norton give most satisfactory results. A large wine cellar is in successful operation and producing superior quality of wines, and affording a certain market for all the grapes grown in the vicinity.

No new varieties of fruit have come under my observation, which are worthy of mention.

I am engaged now in organizing the farmers into clubs and societies; have more than one hundred local organizations in the State.

Will next year commence organizing pomological societies, and from them a State society.

FLORIDA.

Reported by Edmund H. Hart, of Federal Point, Chairman of State Fruit Committee of Florida.

A review of the progress of fruit culture in Florida may fittingly begin with the citrus, which, by reason of magnitude of production, and excellence of quality, outweighs in importance all other branches of pomology in the State. For years there has been a rivalry between Florida and California as to the comparative merits of the citrus fruit produced by each—let us hope a friendly and generous one—which, it was hoped, would be finally settled at the New Orleans Exposition.

The different seasons of ripening, however, in these respective States, rendered the verdict of the judges more difficult to arrive at, and more inconclusive than it otherwise would have been, and while marks of distinguished approbation were awarded to oranges from both sections, beauty of external appearance, and quantity and number of exhibits were the strongest points of those from the Pacific side, and delicacy and piquancy of flavor, a thinness of skin and an overflowing abundance of juice, the distinguishing characteristics of those borne and ripened on the peninsula, between the Atlantic ocean and the Gulf of Mexico. Statistical returns show a large yearly increase in the Florida orange harvest, and considering that this increase will soon be augmented in a compound ratio on account of the vast numbers of young trees coming into bearing, it is evident that our country need not look to foreign sources much longer for its supply of oranges and lemons. Neither does the probable decline in price act as a check upon the industry, for at no time in the past have Floridians been making more strenuous efforts to deluge the world with oranges than at present. The kinds most esteemed abroad, fully sustain their reputation here, and already our list of named varieties, native and foreign, is becoming quite voluminous, but, with a few exceptions, the distinctive points between these varieties, are less apparent than is the case with other fruits.

Among good early sorts, Early Spanish, Nonpariel, Beach's No. 1, and Early Oblong are highly recommended. The list of mid-season fruit embraces many of high excellence, some of which are local favorites. Among them none are more delicious than the Homosassa and Magnum Bonum, whose only fault consists in exceeding the size usually preferred in market.

Beach's No. 5, Malta Oval, Mediterranean Sweet, and Hart's Late may be left on the trees for a considerable time after the others are gathered. The latter sometimes called Hart's Tardive—apparently synonymous with that sent out by Thomas Rivers, of England, under the name of Brown, will hang throughout the summer without deterioration, and may be picked and marketed at any time. This fact is beginning to be recognized by growers, who are planting many thousand trees of Hart's Late, and before long genuine Florida oranges may be found on sale all through the year.

Those of our friends on the Pacific slope who expect to dispose of their oranges in the east after the Florida crop is all in, would do well to consider this.

The losses to growers have hitherto been considerable from dishonest commission men, improper packing and careless handling; the result of negligence or ignorance, and from shipments

at unfavorable times. To assist in the disposal of the fruit to better advantage, and furnish reliable information, an association has been formed under the name of "Florida Fruit Exchange," which, it is hoped, will remedy these evils.

Of late there has been but little complaint of damage from the scale insects often so destructive to orange trees, owing partly to more intelligent modes of combating them, and to the increase of their natural insect enemies. The *mal de goma* or foot rot, and the limb blight have caused trouble in some groves, but effectual remedies are claimed to have been found for even these destructive maladies of the citrus family.

Florida lemons, formerly somewhat unsalable and of doubtful reputation, have been so highly improved by the introduction of the best foreign stock, that they now stand in the front rank. Shipments last fall from this section were pronounced by one of the oldest and largest dealers, to be the finest ever brought into Boston market, and were sold at corresponding prices. The Villafranca is generally considered the best, but the Belair Premium, Genoa, and genuine small Sicily rank very high. The lemon grows on poorer soil than the orange, and is more prolific, but is more easily injured by frost. To obtain the best results trees should be pruned down instead of up, as the fruit on the lower branches is not only more abundant, but of better quality than that grown at a greater distance above the ground.

The lime although still more tender than the lemon, succeeds admirably over the lower half of the State, but as yet has not been planted to any great extent on account of the limited demand for the fruit. The same may be said of the citron, but some future time both of these will be extensively grown for the manufacture of citric acid, lime juice and preserves. For many purposes, limes are superior to lemons, and ignorance of this added to the difficulty of changing long established tastes and habits will explain the small demand for the former in our northern cities.

From Orange County southward, where the danger of frost diminishes, the growing of the strictly tropical fruits is beginning to attract considerable attention. Most of them are very perishable, but rapid transportation in refrigerators will overcome that difficulty, and such delicious fruits as the mango, sapadillo, sugar apple, cherimoya, etc., will become more familiar than of old to the inhabitants of our temperate zone.

From Orange County southward, pineappies are already produced in large quantities and of very fine quality. The Strawberry, Sugar Loaf and the Red Pine are most common, but enterprising nurserymen are testing the choicest foreign kinds with a view to the selection of the fittest when the merits of each shall have been weighed in the balance of experience. The guava, which some have called the apple of Florida from its abundance and from its excellence both in the culinary department and the dessert, is extensively manufactured into jelly and marmalade. Until lately the only guava known in Florida was the tropical species, one that was tender and liable to be destroyed by freezing, but the introduction of the more hardy red and yellow Cattley guavas, (Psidium Cattleyanum), which can bear several degrees of frost, has made the cultivation of this fruit possible, several degrees further north. They bear early and enormously, producing a very superior jelly, as good, if not better than that made from the tender variety.

An increasing interest is manifested in that magnificient fruit—the Japanese persimmon, which here in the home of its adoption, flourishes with the vigor of a native, and bears enormous quantities of very large and delicious fruit. The fondness of opossums for the native persimmon is well-known, and, as might have been expected, these noctural and predatory creatures, which are notoriously abundant in Florida, show their appreciation of good things, by attacking the Japanese persimmons even when two-thirds grown, and commit sad havoc by devouring the fruit and tearing off the branches. Different kinds of birds are also very destructive, and so, although this choicest product of Japanese gardens can be raised in Florida in great abundance and of the finest quality, the possibility of securing a fair share of the crop is the question that most greatly agitates the mind of the *genus homo*. The tree worked upon our native persimmon, grows well, and seedlings make the best stocks, as being less liable to sucker profusely. They should be used when small, the

better to secure a more perfect union, and an absence of decayed wood in the trunk.

The banana generally succeeds well on moist lands of a fair degree of fertility; danger of injury by frosty nights in winter being the chief drawback. For the cooler portions of the State the variety called Hart's Choice is preferred as being the earliest, hardiest and of the finest quality; while in the southern sections, where danger of frost is less, and destructive gales more frequent, the most reliable and profitable sort has been found to be *Musa Cavendishii* or Dwarf Jamaica.

Along the northern border most of the peaches grown in lower Georgia do well, but a little further south, only the Peento, Honey and seedlings of native and acclimatized stock can be relied on. Large orchards of these are being planted in many places. Experiments in hybridizing and selecting, offer a promising field to scientific pomologists, who may thus originate new and valuable kinds, specially adapted to our climatic conditions, which are generally too tropical for growing the Persian strain of peaches.

Pears are for the most part unsuccessful, excepting the Le Conte, Kieffer and other varieties of the Chinese class, young trees of which have been planted in a small and experimental way in various parts of the State, and appear to be doing fairly well, although it is too soon as yet to speak with certainty upon their productiveness, except in the northern counties, where results have been very satisfactory.

Plums of the Chickasaw strain are reliable nearly everywhere, but Gage plums, as well as nearly all the other standard northern fruits, such as apples, currants, gooseberries, cherries and the like, are unproductive and only grown, if at all, as curious exotics.

The cocoanut is being largely planted on the shores and islands of South Florida, where there is no risk of severe frost, but the profits of this industry, on a large scale, are as yet more doubtful in Florida than on the Islands and coasts further south, where conditions of growth are rather more congenial and labor less expensive.

The growing of strawberries, to be shipped north in refrigerators, is becoming a business of considerable magnitude. The fruit is in season from December till June, and although many of the most esteemed northern sorts are unreliable here, a few have given excellent satisfaction. Wilson, Crescent, and the Mobile or Improved Newman stand our summers well and bear fine crops.

Of grapes, the Scuppernong and kindred varieties do the best; yet most other kinds succeed fairly, though but few attempts have been made to raise them on any large scale. A very fine wine, somewhat resembling sherry, is made from the sweet orange.

The fig, which is very long lived, and one of the most prolific of all fruit trees, has been generally and undeservedly neglected. There is nothing to hinder the production of figs in any quantity, but if prepared like the imported article, they would need to be dried artificially, as in Florida they usually ripen in the showery season.

The Loquat or Japan plum is now becoming a familiar object in our markets during March and April. This fruit has not yet received the attention it deserves, and thus far growers have not attempted to improve it, but have remained content with chance seedlings. It improves rapidly by selection, and gives the best results on a moist and rich soil, especially one mingled with clay or marl. Shipments to northern markets have not brought satisfactory returns, but if better known it would doubtless be more salable, as it is eagerly bought in our home cities. The fruit makes a delicious jelly, besides being very salutary as an appetizer and a corrective of a bilious state of the system, while for culinary purposes it is unexcelled, being fully equal to the cranberry in piquancy of flavor.

To the fruit growers of Florida a new and almost untrodden field is open, in the way of introducing and developing the numerous species of tropical and semi-tropical fruits, which exist in foreign countries, and nowhere more abundantly than in Mexico and South America. In Paraguay and the Argentine Republic, where the climatic conditions closely resemble those of Florida, there are found many species of fruit bearing and valuable timber trees, scarcely known as yet to the scientific botanist. Most of these ought to succeed in Florida. There is also a great variety of fruit trees in Equatorial South America, many of which have never been cultivated and are unknown beyond their limited habitats, and doubtless some of these might be

profitably introduced into South Florida. These facts and possibilities are mentioned in order to elicit the interest of fruit growers, for it is evident from the slow and inefficient action of our Agricultural Department in the matter, so different from the paternal consideration of the British and other foreign governments for their colonies, that what is to be done must be done by private enterprise.

ARKANSAS.

Reported by S. J. Matthews, of Monticello, Chairman of State Fruit Committee of Arkansas.

I have scarcely a word to add to former reports from this State. Along the lines of railways there has been a large number of trees planted of late, especially of the extra early peaches. There are already getting to be altogether too many of these. They all have a decided tendency for going straight and rapidly on from ripeness to rotteness, rendering shipments of them extremely risky, even when they are wanted; and I don't think people care for them now, as they did a few years ago, when peaches in June were more of a rarity than they now are. Ives and Perkins grapes are the most profitable shipping fruits with me. The Crescent is the best market strawberry. The Wilson has got to dying out on the advent of hot weather, in a way that threatens to necessitate its abandonment down in this climate.

The fruit crop in general, here, is about an average as to quantity and quality.

MISSISSIPPI.

Reported by William H. Cassell, of Canton, chairman of State Fruit Committee of Mississippi.

Without repeating at length what has been stated in previous reports, I will say that nearly all the species of fruit grown in temperate latitudes, find a congenial home in some part of this State, while along the Gulf coast the citrus family is receiving considerable attention, some very fine oranges being grown there. The fig thrives throughout the State, with slight protection in the northern part. In fact, so great is the variety of fruits grown here that at the late World's Exposition in New Orleans, California alone excelled us in this respect. Mississippi was awarded much the greater number of fruit premiums in the southern district. And this was the first systematic effort ever made to bring together the pomological products of the whole State.

The greater part of the fruits grown here are early and mid-season. Autumn and winter fruits are yet scarce, although trees of these sorts have been largely planted in the last few years, a few of which are coming into bearing in different places. It is hoped that we will soon have a reasonable quantity of winter apples, especially. We ought to have had them years since, but the earlier trees that were planted here were from northern nurseries, and though of varieties probably well suited to northern latitudes, were wholly unsuited to ours; our longer summers being too much for them, causing them to rot and fall off, almost without exception. Their failure discouraged planters and induced the belief that winter apples were an impossibility here. The gradual introduction and success of southern varieties, however, is overcoming this prejudice, and the planting of late apples and other fruits is rapidly increasing. At the late Exposition the increased number of specimens of fruits in solution, over those in the fresh state was plainly noticeable, showing that the bulk of our fruit is of the early kinds. Nearly all these, however, were of varieties in the catalogue or otherwise previously reported.

In apples, the Shannon does well in this vicinity so far as tested. Roxburry Russet has borne several good crops here, and it is remarkable that the handsomest plate of this variety shown by any State at the late Exposition was from fruit grown in this county (Madison.)

Of blackberries the Kittatinny bears heavily; fruit firm in quality, of fair size, and no rust so far; canes grow vigorously.

In pears I wish to speak of the Edmunds; tree very vigorous, bears heavily; fruit irregular, but quality excellent; has borne two crops here, and is well liked in eastern part of the State. The LeConte, which has borne in several parts of the State, fruited here this season for the first time; is of fair size, typical in form, and rather handsome in appearance, being a light yellow, or greenish yellow color; had no opportunity of testing its quality, though I have seen and eaten the fruit before. This pear is being planted extensively in this State, a neighbor of mine proposing to plant thirty acres this fall. I wish to make a statement just here and ask a question or

two. It is claimed by the growers of this variety near Thomasville, Georgia, that it should not be grafted on the European stock, or on the quince, but be grown on its own roots; that is, from cuttings. The principal reason alleged for this, is because it is exempt from blight only on its own roots. It is claimed, also, that it does not grow as well on the European stock, and that it will overgrow this, becoming larger above than below the junction, thus forming an unsightly tree. It is claimed, also, that it does not bear so well, is not so reliable; in short, that is comparatively worthless, except on its own roots. Now, without questioning the sincerity of these statements, I will say that I have this variety on its own roots, root grafted on imported French stocks, and top grafted on sprouts that sprung up where orchard trees had died, and so far I see no difference in the growth and vigor of the trees here, under similar conditions. Several on own roots and top grafted, are in their third year from planting. The union of these grafts, two and a half to three feet above ground, is perfect, with no sign of overgrowing the stock. On examining two-year nursery trees, at the junction of the graft and stock, the union seemed to be equally perfect. So that two of the four reasons assigned for preferring the cutting, do not seem to apply here. As to its bearing quality, and freedom from blight, it is yet too early to decide, but no sign of blight has yet appeared in either case. I would like to ascertain its relative behavior in other sections. If I am correctly informed, pears generally, of the European type, do not succeed well around Thomasville, and this may account for the feeble growth and unsatisfactory results, when the European stock is used there. Now, then, if the vigor of the Le Conte is impaired by placing it on the European stock, and it is thereby rendered subject to blight, and perhaps other diseases also; will not continued propagation, by cuttings, eventually produce the same result? Any variety of the European type can be grown with care, from cuttings, but it is thought the best trees are made by grafting on seedlings; the young, fresh life of the seedling being supposed to impart greater vigor to the future tree, than the cutting does. Would not the vigor of this variety be the better retained, and its healthfulness preserved, if it were grafted on young seedlings of its own, the China Sand, or other Asiatic pears? A fruit possessing so many valuable characteristics is well worthy of special effort for its protection and preservation.

New Native Varieties—I would mention Parker's Cling, a fine, large peach, originating here, and ripening last of August and early September. It is a handsome fruit, partaking somewhat of the Indian type, with a high, vinous flavor, and coming in when good peaches are usually scarce; a little after the Heath Cling; tree very vigorous.

The Hughes plum, a native of this State, of the Chickasaw type, and ripening in July, is highly recommended in the northeastern part of the State, where it originated; and bears excellent fruit here. It is nearly as large as Wild Goose; form round, color bright red, and quality good to very good; tree very productive. Some two years since my attention was called to the Watts plum, as being a very fine variety. This is grown by Dr. D. S. Watts, of this county. Being in the vicinity recently, I called on him and was shown the trees, and he gave me some of the fruit. I was surprised to find three varieties among them, perhaps I should say sub-varieties. They are all seedlings, grown from a tree on a neighboring farm, the origin of which is not known. One is a bright yellow, round in form, and nearly as large as the Wild Goose. The other two are bright red in color, same size as the yellow; but one is round and the other oval. The yellow is rather the earliest, the round red next, and the oval latest, though all ripen in August and September. All were ripe when I saw them (August 15), and would class good, if not very good, in quality. The flesh is firm until fully ripe, and they would ship any distance. I kept some of these for a week after picking. The leaves are quite large and smooth; trees are strong growers. I will propagate these, especially the latest one.

Two valuable apples have fruited in this State for several years, but I do not think they can be called new varieties. Still, as the original names are unknown, we must supply others, until they can be indentified. One, a very large fruit, somewhat resembling Ben Davis, but larger in size; not so regular in form, and better in quality. I call it Brown's Yazoo. It begins to ripen in early October, and can be kept until February here. The other, a medium or small sized fruit; green, nearly covered with red; form round,

quality very good to best: season, October and later. It grows on the farm of Wesley Johnson, of Hinds county, and I believe is called Johnson's Red Winter.

Several excellent seedling peaches have been brought to my notice, but of not sufficient merit to add to our already long list of fine varieties.

Statistics—These are difficult to obtain. I have made requests of several parties at the leading shipping points, who were in a position to know the facts we inquired for, but have received but one reply up to this date. This is from Mr. S. H. Stackhouse, of Crystal Springs, an interesting paper which I enclose. Strawberries are being planted in quantity for market, still, in different places. The past season was not a very profitable one to some of our leading berry growers, as a very heavy rainstorm, occuring during the first heavy bloom, so injured the crop as to lessen greatly its money value. Raspberries are being planted for market at several points, but too early yet to say with what success. Grape planting is on the increase, especially the Scuppernong, for wine making, and if the coming man drinks wine, these plantations are likely to prove very valuable. Apples are not much grown for profit.

Peaches are planted both for market and family use. More peaches than of any of the larger fruits are grown for market. The planting is by the hundred and thousand trees. The earliest varieties are not sought for as much for shipping as they were formerly. The last two seasons being very wet at the time of the ripening of Alexander, Amsden, etc., it was difficult to get these varieties to distant markets in good condition and shippers were very much disappointed in their profits. The later June and July peaches being larger, firmer, and standing carriage better, are growing in favor, and sought for in planting. Tillotson, May Beauty, Crawford's Early, Mountain Rose and Thurber, with a considerable percentage of Chinese cling are wanted. We are beginning to have some of the experience of our New Jersey and Delaware growers in this vibration from early to late in quest of the best market season for the peach.

Of pears there are more Bartlett and Angouleme shipped now than any others; but there will be more Le Contes after a few years, judging from present planting. The Jefferson is shipped from some two hundred bearing trees at this point. There are some trees of the Julienne, which bear regularly and pay well, coming in ahead of the Bartlett. Its greatest fault is lack of size.

Of plums there is one orchard of one thousand trees of the Wild Goose in this county that are just getting of good bearing age and size, but I don't know how it pays up to this time. At the present rate of planting, the I. C. R R. will soon be lined with fruit trees and vines from Hazlehurst on the south, to Grenada on the north, if the planting does not extend the entire length of the State traversed by this road; and the managers are increasing their facilities for the transportation of the fruit.

The planting is increasing on the Mobile and Ohio Railroad also.

REPORT FROM CRYSTAL SPRINGS.

The following letter from S. H. Stackhouse, of Crystal Springs, Miss., Secretary of the State Horticultural Society of interest and supplements the above report.

There are about two hundred acres in strawberries around Crystal Springs. The yield was poor this year, owing to drought and unknown causes. The old Wilson seems to be the leading variety. Charleston much firmer, but not a reliable bearer. Sucker State a prolific bearer, and does well, and brings good prices in the Chicago market. Crescent is being tried, although we don't think it firm enough to stand eight hundred miles transportation. Many new varieties have been tried and discarded. For long distances, firmness is of the greatest importance, and the Wilson and Charleston seem to possess these qualities in a higher degree than other varieties yet tested. The greatest enemies to the strawberry-grower, are the grub and drought. During a dry year the pest is more injurious. Consequently, during very dry years, what very often is attributed to the dry season is nothing more than the depredation of the grubs. The great requisites for a big yield of strawberries, are good varieties, plenty of the right kinds of manure, clean culture and abundance of moisture.

Peaches.—This has been a successful peach year. The yield has been heavy and prices generally have been quite remunerative. Something new in the mode of transportation has been introduced, saving enormous expressage, and placing the fruit in the market even in better

condition. We mean refrigerator cars, which were first introduced this season by some of the commission houses of Chicago. The yield this year will be over 40,000 one-third bushel boxes. Varieties which seem to do best and are most marketable are Early Rivers, May Beauty, Mountain Rose, Tillotson, Thurber, Crawfords and Picquett's Late.

A few years ago many persons planted the earlier varieties: Alexander, Amsden and Brigg's May, but they proved failures. Every one went into the early peach business, consequently early peaches tumbled down to 25 cents per box in the Chicago and St. Louis markets. Early varieties now are not relied upon. They are liable to rot, and most of them are seedlings of Hale's Early, which in the South, rots before you can get to the depot. The acreage is not less than 250 acres, and a great many trees have been planted during the last few years.

Bone dust and kainit, or bone dust and ashes scattered broadcast are about the best fertilizers. Few soils are adapted to peach culture. The most successful orchards here are on a black, loamy, sandy soil, found in the piney woods regions. It seems to be the home of large, lucious, finely developed, and beautifully colored peaches; no doubt similar to the famous peach lands of Michigan.

Another improvement is in the package of this fruit, in order to show off to the best advantage. Nothing sells in a mean package, and we think it applies more forcibly to this fruit. The following makes a neat package, and was used this season with much success. A common strawberry crate is made without the centre piece. Three baskets fit smoothly into the crate, which is covered with a pink or red gauze, in order to make the package more attractive.

Mr. Hopper, of Illinois, is testing about sixty varieties of grapes here, among them a great many foreign varieties. We have found the Champion a good market grape owing to earliness; Delaware, Brighton and the Lady seem to do well; Concord is about discarded.

The culture of plums is much interfered with, owing to the slug and curculio. Figs were shipped this year to the Chicago market, eight hundred miles in refrigerator cars, and reached their destination in good condition. Le Conte pear flourishes well where tried. Many have tested the Japanese persimmon, but we don't think it will ever amount to much more than an ornamental tree.

NEW MEXICO.

[Having no report from New Mexico, the following letter from Chief Justice L. Bradford Prince is taken as a substitute. Judge Prince is a son of the late Wm. R. Prince, of Flushing, the most distinguished of American nurserymen in his day. Certain portions of New Mexico have great fruit-growing capacities. We know that trees are now being planted there to a considerable extent, and we may expect good reports in the near future.—CHAIRMAN COMMITTEE.]

A letter from Chief Justice L Bradford Prince — the display at the first Territorial Fair.

In an interview published in the New York Tribune, of July 12, I said: The valley of the Rio Grande presents altogether the finest fruit-growing section between the Mississippi and the Rocky Mountains. Unless I am greatly mistaken the whole of this great valley will, in ten years, be a succession of orchards and vineyards. One can find almost any temperature he desires between Mesilla and Bernalillo, and the whole is admirably adapted to grape culture and wine making, and to the raising of peaches, plums, apricots, apples, pears, etc. No better investment can be made in the country to-day than in planting fruit orchards and vineyards of improved varieties in this charming valley.

We are now holding our first Territorial fair, at this place, and the display of fruit fully justifies every word of the above. I wish the exhibition could be transported bodily to some convenient place in the east for inspection. As exact statements are what practical men want, I send a few weights and measurements made by myself. One peach weighs 11¾ ounces, and is 10¾ inches in circumference; there are many nearly as large, and I have bought them on the street from ordinary venders nine inches around. A Golden Pippin apple is 13¼ inches in circumference and weighs just a pound.

Northern Spy apples are very uniform, three that I measured, from different localities, measuring respectively 13⅛, 13½ and 13¾ inches. It is proper to add, that many of the finest apples are from the Pecos Valley, which seems as well adapted to this culture as that of the Rio Grande. Quinces are very fair and fine. They are here

measuring 13½ inches around the short circumference, and weighing 20 ounces. Bartlett pears are uniform in size, 11½ inches the short way round and weighing 15 to 16 ounces. One grape vine is on exhibition bearing 160 bunches of grapes; and in passing I may remark that no delicious grapes are anywhere to the found than in this valley. The display of wine is extensive and the quality is pronounced by judges to be very superior. In vegetables there are fine squashes, melons, beets, turnips, tomatoes, cabbages weighing up to 35 pounds, cauliflowers up to 17 pounds, and potatoes of which six weighed over 9 pounds.

While writing, let me add a word as to the mineral display. And I will confine what I say to the single collection of the Hon. M. W. Bremen, of Silver City. He has been offered $30,000 for his cabinet, but will not sell it at any price. It contains 1,700 pounds of silver ore of various kinds, all worth over $10,000 to the ton. There is massive horn silver containing 75 3-10 per cent., pure silver; and mixed chloride, sulphide and bromide containing 87 1-10 per cent. One lump of 232 pounds carries $15,000 to the ton. The most curious specimens, perhaps, are a slate containing pure silver between the layers of stone.

Some eastern fair ought to try to induce Mr. Bremen to bring this collection to the Atlantic States.

REPORT OF THE COMMITTEE

ON

REVISION OF THE CATALOGUE OF FRUITS.

To the American Pomological Society:

Gentlemen—The undersigned committee respectfully reports that since the last session of the Society, held at Grand Rapids, Michigan, September 9 to 12, 1885, they have made a careful examination of the several State reports, presented at the meeting, and received since, and have made the changes in the catalogue as recommended therein. Nearly three hundred changes, chiefly in the starring, have been made. Very few varieties have been added or removed.

The following varieties are recommended in the various State reports, but, as many of them have only a local reputation, and have not been described, and as others are of recent origin, and not sufficiently tested to establish their permanent value, it has been deemed prudent to place their names here, with the States in which they are recommended, in order that attention may be called to them, descriptions of them obtained, and their identity settled before they are placed on the Society's lists.

State Committees are requested to furnish descriptions of them, and if convenient send specimens of them to the Chairman of the General Fruit Committee during next season.

It will be seen that the revised nomenclature, adopted by the Society at the session of 1883, has been followed. The most distinguished and reliable pomological writers, and other authorities, have approved and recommended these changes, and it is hoped and expected that their adoption will be general throughout the country.

MARSHALL P. WILDER, *Pres't, Ex-officio.*
W. C. BARRY, Rochester, N. Y.,
HENRY M. ENGLE, Marietta, Pa.,
ROBERT MANNING, Salem, Mass.,
P. J. BERCKMANS, Augusta, Ga.,
D. W. BEADLE, St. Catharines, Ont.,
Committee on Revision of Catalogue.

List of varieties recommended in State reports of 1885 but not yet placed in the catalogue:

APPLES.

*Bloom, New Brunswick; *Bowman's Excelsior, North Carolina; *Early Renwick, Kansas; *Early Scarlet, New Brunswick; †Gano, Missouri; **Gideon, New Brunswick; *Honey Pink, New Brunswick; *Hunge, North Carolina; †Kernodle's Seedling, North Carolina; †Loy, Missouri; **McMahan, Wisconsin; †McCuller's Winter, North Carolina; *Mountaineer, North Carolina; *Ontario, Ontario; *Queen Pippin, North Carolina; †Rankin, Missouri; *Red Gilliflower, North Carolina; *Santa, Mississippi; †Shackelford, Missouri; †Shannon, Mississippi; *Sharp's Winter, North Carolina; *Summer Harvey, New Brunswick; *Virginia Beauty, North Carolina.

CRABS.

*Telfer Sweet, Wisconsin.

CHERRIES.

† Osthrimer, Missouri; * Conestoga, Pennsylvania; * Dyehouse, Virginia.

CURRANTS.

* French's Transparent, * Dana's Transparent, Massachusetts.

NECTARINES.

† Kirkman's Mammoth, North Carolina; * Princes Golden, North Carolina; * Southern Queen, North Carolina.

PEACHES.

*Albright's October Cling, North Carolina; * Cooper's Late, Delaware; † Early Beauty, Delaware; † Early Lydia, Delaware; † Evans, Missouri; † Howard, Missouri; * Lady Palmerston, North Carolina; ** Lady Ingold, North Carolina; † Lady Ingold, Delaware; † Lydia, Missouri; † Munson, Missouri; † Nectar, Missouri; * Sallie Worrell, North Carolina; * Shipley's Late Red, Delaware; ** Stephens Late Rareripe, Delaware.

PEARS.

* Comet, North Carolina; † Edmonds, Mississippi.

PLUMS.

* Blue Gage, North Carolina; * Sand, Kansas.

RASPBERRIES.

† Hopkins, Rhode Island; † Kimball, Rhode Island.

STRAWBERRIES.

† Atlantic, Rhode Island and Kansas; † Cornelia, Connecticut; † Henderson, Rhode Island; † Indiana, Kansas; † Jewell, Connecticut and Kansas; * Longfellow, North Carolina; † Mrs. Garfield, Kansas; * Parry, Rhode Island; † Warren, Rhode Island.

CATALOGUE OF FRUITS.

PLAN OF CATALOGUE.

The arrangement of the names of varieties in the Catalogue is alphabetical and according to the nomenclature adopted by the Society. Synonyms are given in a few instances where it seemed necessary, and these are placed under the adopted names in italics.

The columns are arranged thus: In the first the names of varieties, in the next seven colums the description, and in the remaining columns the States or Districts.

The State or District columns are not placed in alphabetical order, as in the octavo editions, but are grouped in *Divisions* somewhat similar in climate, and other characters affecting fruit culture. Thus: 1.—Northern Division—between 42° and 49°. 2.—Central Division, between 35° and 42°. 3.—Southern Division, between 28° and 35°.

The State or District in which a fruit is recommended for cultivation is designated by a star (*), and it the variety is of great superiority and value, two stars (**); if new or recently introduced and promising, by a dagger (†).

I.—APPLES.

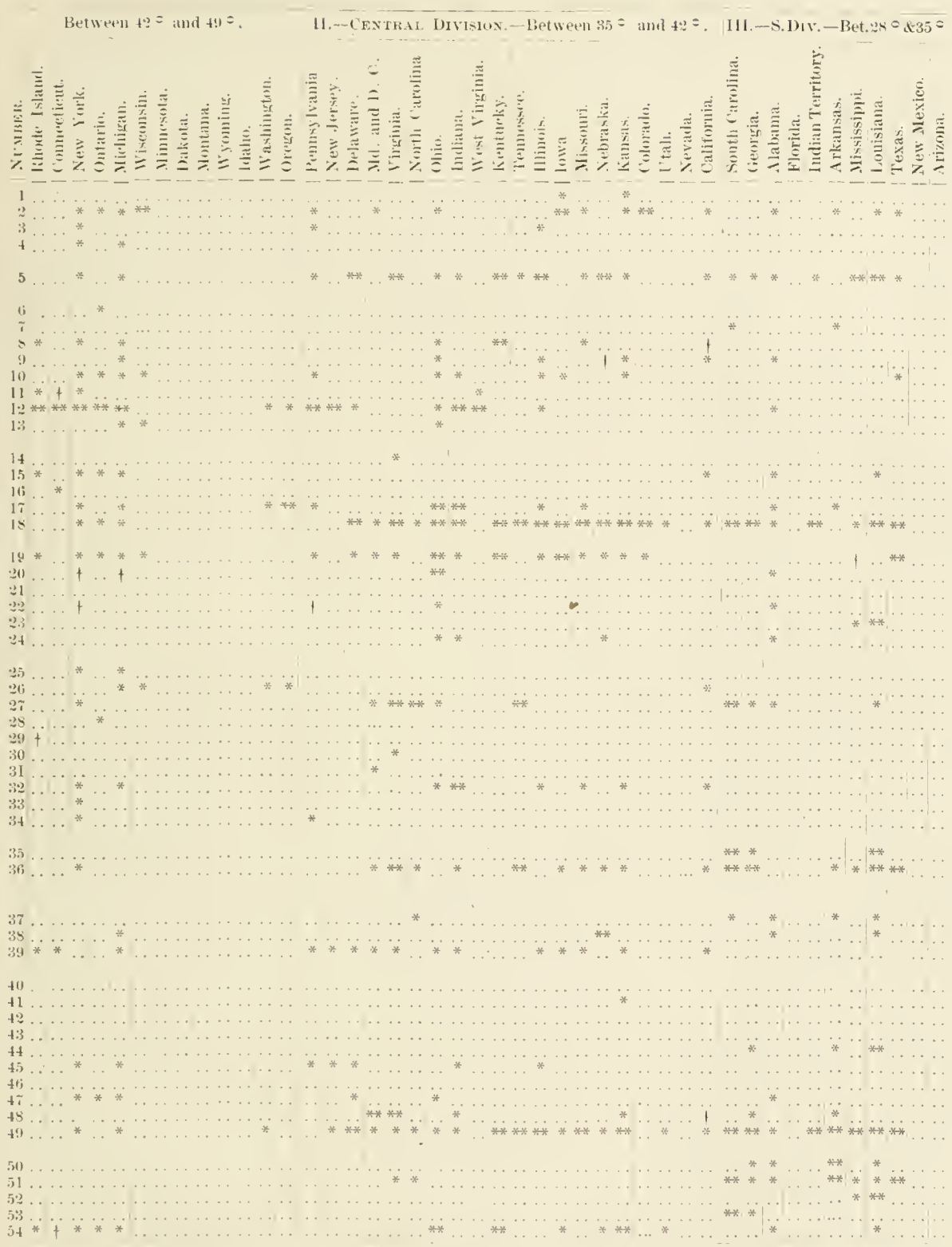
EXPLANATION OF ABBREVIATIONS.—The size is understood by l. for large; m. for medium, and s. for small. The FORM—r. c. for roundish conical; ob. for oblong; r. ob. for roundish oblate; fl. for flat or oblate; r. for roundish. The COLOR—y. r. for yellow and red; r. s. for red striped; g. y. for greenish yellow; rus. for russeted; y. rus. for yellow and russet. The QUALITY—g. for good; v. g. for very good; b. for best. The USE—F. fruit valuable for all family purposes: K. M. valuable for kitchen or market purposes; F. M. family and market. The SEASON—S. for summer; E. A. for early autumn; L. A. for late autumn, and W. for winter. All these characters of course only designate leading positive features, and vary in their distinctness according to soil and climate in which they are grown. The ORIGIN is shown by Rus. for Russian; Eng. for English; Am. for American; Ger. for German; F. for foreign.

Number.	Names.	Description.							I.—N. Div.—					
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Alerson's Early	m.	r.	y.	v. g.	K.	S.	Am.						
2	Alexander	l.	r. c.	r. s.	g.	K. M.	E. A.	Rus.	*	**	*		*	*
3	American Beauty	l.	r. ob.	y. r.	v. g.	F. M.	W.	Am.						*
4	American Golden	l.	r. ob.	g. y.	v. g.	F. M.	W.	Am.		*				
	American Golden Pippin.													
5	American Summer	m.	ob.	y. r.	b.	F.	S.	Am.			*		*	*
	American Summer Pearmain.													
6	Arnold's Beauty	m.	fl.	y. r.	v. g.	F.	W.	Am.						
7	Aromatic Carolina	l.	fl.	y. r.	v. g.	F.	A.	Am.						
8	Autumn Bough	m.	r. c.	g. y.	v. g.	F.	E. A.	Am.						
9	Autumn Swaar	m.	r. ob.	g. y.	v. g.	F.	L. A.	Am.						
10	Bailey Sweet	l.	r. c.	r. s.	v. g.	F. M.	L. A.	Am.					*	
11	Baker	l.	r. ob.	y. r.	v. g.	K. M.	W.	Am.						
12	Baldwin	l.	r. c.	r. g.	v. g.	F. M.	W.	Am.	**		*	**	**	**
13	Baltimore	m.	r. c.	r. y.	v. g.	F. M.	W.	Am.						
	Cable's Gilliflower. Mahaska.													
14	Baltzby	l.	r. ob.	y.	g.	F. M.	A.	Am.						
15	Beauty of Kent	l.	r c.	r. s.	g.	K. M.	L. A.	Eng.			*			*
16	Belden Sweet	m	r. c.	y.	g.	F.	W.	Am.						
17	Belmont	l.	r. c.	y. r.	b.	F. M.	W.	Am.					*	
18	Ben Davis	l.	r. c.	y. r.	g.	K. M.	W.	Am.	*					
	New York Pippin.													
19	Benoni	m.	r. ob.	y. r.	v. g.	F. M.	S	Am.				**	**	*
20	Bentley's Sweet	m.	r. ob.	g. y.	v. g.	F. M.	W.	Am.						
21	Berkshire Spy	m.	r. c.	r. s.	v. g.	F.	E. W.	Am.						*
22	Bethlemite	l.	r. ob.	y. r.	b.	F. M.	W.	Am.						
23	Bevan's Favorite	m.	fl. c.	y. r.	g.	F.	S.	Am.						
24	Black Apple	m.	fl.	d. r.	g.	F.	W.	Am.						
	Jersey Black.													
25	Blenheim Pippin	l.	r. ob.	y. r.	v. g.	F. M.	W.	Eng.	**				*	
26	Blue Pearmain	l.	r. c.	r.	g.	M.	W.		*		*		*	*
27	Bonum	l.	r. ob.	y. r.	v. g.	M.	L. A.	Am.						
28	Bourassa	m.	r. c.	y. r.	g.	M.	L. A.	Ger.						
29	Bowen's Favorite	m.	r. ob.	r.	g.	M.	A.	Am.						
30	Bower's Nompareil	l.	fl.	y. r.	v. g.	F. M.	W.	Am.						
31	Bowling's Sweet	m.	r.	y. r.	g.	M.	L. A.	Am						
32	Broadwell	m.	r. c.	g. y.	v. g.	F. M.	L. A.	Am.	*					*
33	Brittle Sweet	m.	r. c.	r. s.	v. g.	F.	E. A.	Am					*	
34	Brown	l.	fl.	r. s.	v. g.	F. M.	L. A.	Am.						
	Nottingham Brown.													
35	Bruce's Summer	l.					S.	Am.						
36	Buckingham	l.	r. ob.	y. r.	v. g.	F. M.	E. W.	Am.						
	Fall Queen of Kentucky. Bachelor. Equinetely.													
37	Buff	l.	r. ob	y. r.	g.	F.	W.	Am.						
38	Buffington's Early	m.	fl.	y.	g.	F.	S.	Am.						
39	Bullock's Pippin	s.	r. c.	y. rus.	b.	F. M.	W.	Am.						*
	American Golden Russet													
40	Burlington Pippin	m.	fl. c.	y. r.	v. g.	F. M.	W.	Am.					*	
41	Cadwallader's Golden	m.	r. ob.	y.	g.	K. M.	W.	Am.						
42	Calef Sweet	l.	r. ob.	y.	v. g.		W.	Am.				*		
43	Calkin's Pippin	l.	r. c.	y. r.	g.	F. M.	W	N. S.	*					
44	Camack Sweet	m.	r. ob.	y.	g.	F. M.	W.	Am.						
45	Campfield	m.	r. ob.	g. r.	g.	M. K.	W.	Am.						
46	Canada Baldwin	m.	ob.	r.	v. g.		W.	Can.		*				
47	Canada Reinette	l.	r. c.	g. y.	v. g.	F. M.	W.	F.	*	*	*		*	
48	Cannon Pearmain	m.	r. c.	r. s.	v. g.	F.	W.	A						
49	Carolina June	m.	r. c.	r. s.	v. g.	F. M.	S.	Am.				*		
	Carolina Red June.													
50	Carolina Watson	m.	fl. c.	g. y. r.	g.	M.	S.	Am.						
51	Carter's Blue	l.	r. ob.	g. r.	v. g.	F. M.	E. A.	Am.						
52	Cane Creek Sweet	m.	r.	y.	g.	F.	S.	Am						
53	Chattahoochee	m.	fl.	y.	g.	M.	W.	Am.						
54	Chenango	m.	ob. c.	g. r.	v. g.	F. M.	E. A.	Am.	*			*		

2 Moderate bearer; showy; hardy.

5 slender grower, but healthy.

12 In Vermont adapted only to the Southern and Western parts of the State south of Burlington.

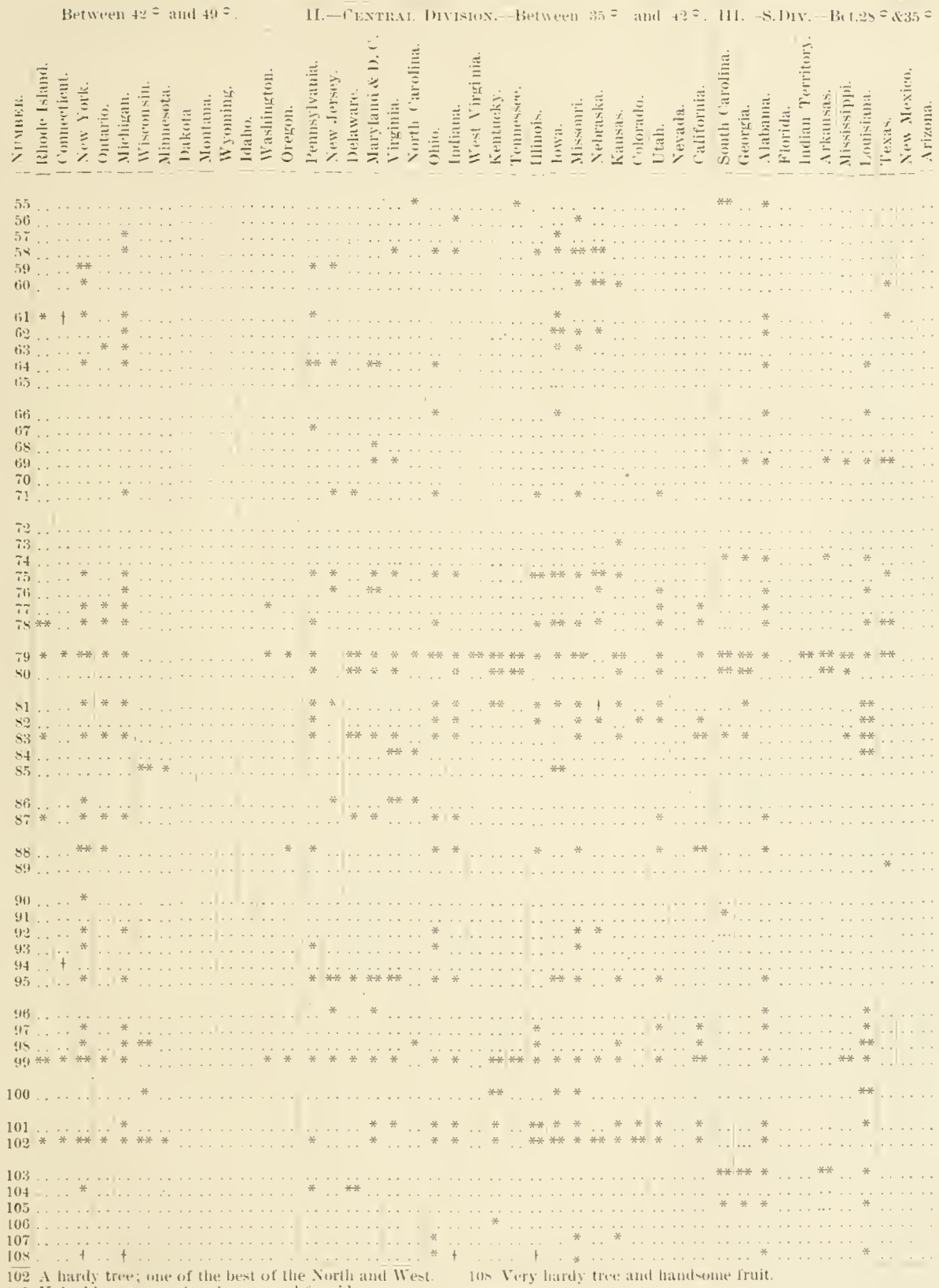


13 A hardy tree; very productive.
15 A coarse, showy fruit.
17 Fine for table; too tender for shipping.
18 Valuable shipping sort.
20 Fine winter variety.
22 Resembles Newtown Spitzenburgh.
45 Valued for stock and cider.
49 Esteemed South and West.
51 Valued at the South.

Number.	Names.	Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	DESCRIPTION. I.—N. Div. Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
	Chenango Strawberry, Sherwood's Favorite.													
55	Clark's Pearmain	m.	r. ob.	y.	v. g.	M.	W.	Am.						
56	Clayton	l.	c.	y. r.	g.	F. M.	W.	Am.						
57	Clyde Beauty	l.	r. c.	g. r.	g.	F. M.	W.	Am.	*					
58	Cooper	l.	r. ob.	g. y.	g.	M.	L. A.							
59	Cooper's Market	m.	r. c.	y. r.	g.	M.	W	Am.						
60	Cooper's Early	m.	r.	y.	g.	M.	A.	Am.						
	Cooper's Early White.													
61	Cogswell	m.	r. ob.	y. r.	b.	F. M	W.	Am.						**
62	Cole's Quince	l.	r. ob.	g. y.	v. g.	F. M.	W.	Am.			*			*
63	Colvert	l.	r. ob.	y. r.	g.	F. M.	L. A.	Am.	*					
64	Cornell's Fancy	m.	ob.	y. r.	g.	F. M.	L. A.	Am.						
65	Cox's Orange	m.	ob.	y. r.	v. g.	F.	E. A.	Eng.	*					
	Cox's Orange Pippin.													
66	Cracking	l.	r. ob.	y.	g.	K.	L. A.	Am.						
67	Creek	m.	fl. c.	y. r.	v. g.	F. M.	W.	Am.						
68	Cross	l.	r. ob.	r. s.	v. g.	F. M.	S.	Am.						
69	Cullasaga	m.	r. c.	y. s.	g.	M.	W.	Am.						
70	Curtis Sweet	l.	r. c.	y. r.	g.	K.	L. A.	Am.					*	
71	Danvers Sweet	m.	r. ob.	g. y.	v. g.	F. M.	W.	Am.			*	*		*
	Danvers Winter Sweet.													
72	Dean	m.	fl.	r. s.	v. g.	F. M.	E. A.	Am.			*			
73	Detroit Red	m.	r. ob.	r.	g.	F M.	E. W.	Am.						
74	Disharoon	m.	r. c.	g.	g.	F. M.	A.	Am.						
75	Dominie	m.	r. ob.	g. r.	v. g.	F. M.	W.							
76	Drap d'Or	l.	r. ob.	y.	v. g.	F.	S.	Ger.	*					
77	Dutch Mignonne	m.	r. ob.	r. s.	g.	M.	W.	Ger.					*	
78	Dyer	m.	r.	g. y.	v. g.	F.	E. A.	F.			*		**	*
	Pomme Royal.													
79	Early Harvest	m.	r. ob.	g. y.	v. g.	F. M.	S.	Am.	*	**	**	*	*	*
80	Early Margaret	m.	r.	r. s.	v. g.	F. M.	S.	Ger.					*	
	Early Red Margaret.													
81	Early Joe	s.	fl.	y. r.	b.	F.	S.	Am.					*	*
82	Early Pennock	l.	r. c.	g.	g.	M.	S.	Am.			*	*		
83	Early Strawberry	s.	r.	r. s.	v. g.	F.	S.	Am.			*	*	*	*
84	Early Ripe	m.	r. ob.	y.	g.	F.	S.	Am.						
85	Edgar Red Streak	l.	r. ob.	r. s.	v. g.	F.	W.	Am.						
	Walbridge.													
86	Edward's Early						S.	Am.						
87	English Russet	m.	r. c.	y. rus.	v. g.	F. M.	W.	Eng.			*		*	
	Poughkeepsie Russet.													
88	Esopus Spitzenburg	l.	ob.	y. r.	b.	F. M.	W.	Am.	*		†	*	*	
89	Etowah	m.	ob. c.	y. r.	g.		W.	Am.						
	Cooper's Red.													
90	Eustis	m.	r. ob.	r. s.	v. g.	F.	E. W.	Am.						*
91	Eutaw						A.	Am.						
92	Evening Party	m.	fl.	r.	v. g.	F. M.	W.	Am.						
93	Ewalt	l.	r.	y. r.	g.	M.	W.	Am.						
94	Excel	l.	ob. c.	y. r.	v. g.	F. M.	W.	Am.						
95	Fallawater	l.	r. c.	g. y.	g.	M	W.	Am.	†					
	Fornwalder, Tulpehocken.													
96	Fall Harvey	l.	r. ob.	g. y.	g.	M.	L. A.	Am.	†		*			*
97	Fall Jenneting	l.	fl.	g. y.	g.	M.	E. A.	Am.	*		†			
98	Fall Orange	l.	r.	y. r.	g.	K. M.	L. A.	Am.					*	
99	Fall Pippin	l.	r. ob.	g. y.	v. g.	F. M.	L. A.	Am.	*		†		*	*
	Holland Pippin, erroneously.													
100	Fall Queen	m.	ob. c.	y. r.	g.	F. M.	A.	Am.		**				
	Hass, Gross Pommier.													
101	Fall Wine	m.	r. ob.	r. y.	b.	F.	L. A.	Am.		*		**		
102	Fameuse	m.	r. ob.	r. s.	v. g.	F. M.	W.	F.	*	**	**	**	**	*
	Pomme de Neige, Snow Apple.													
103	Family	m.	fl. c.	y. r.	v. g.	M.	S.	Am.						
104	Fanny	m.	fl.	r. s.	v. g.	F. M	S.	Am.						
105	Ferdinand	l.	fl.	o. y.	g.		A.	Am.						
106	Ferris	m.	r. fl.	y. r.	g.	F. M.	W.	Am.						
107	Fink	m.	fl.	y. r.	g.	M.	L. W.	Am.						
108	Fourth of July	m.	r. ob.	r. s.	g.	M.	S.	Ger.	†					

75 Productive and hardy.
78 Valued for dessert.
79 Succeeds best on strong soils

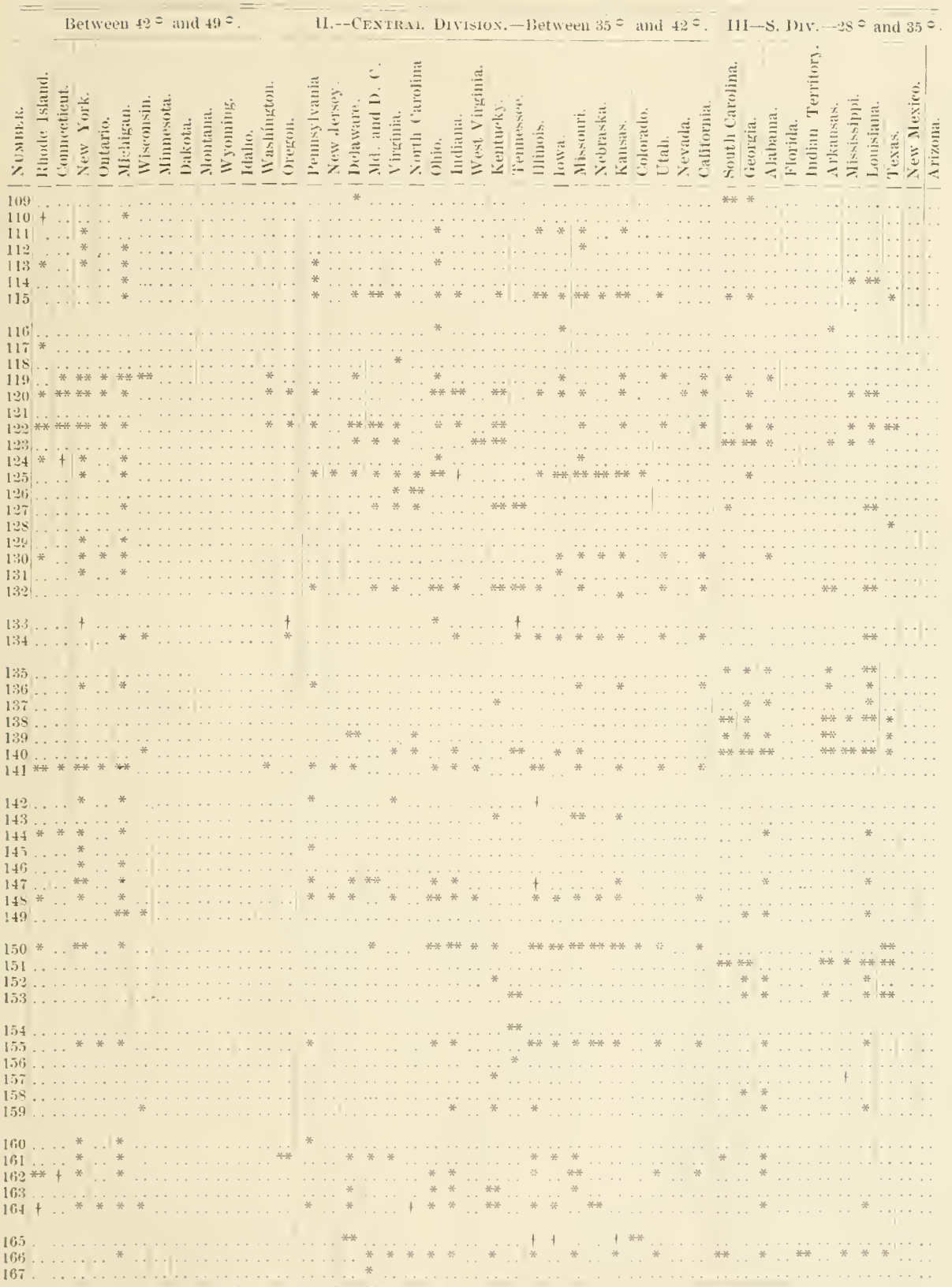
81 A delicious table sort; tree of small growth.
82 Popular market sort.
83 Continues a long time after ripening: often called Red Juneating



102 A hardy tree; one of the best of the North and West.
107 Valuable as a very late keeper and for cider.
108 Very hardy tree and handsome fruit.

Number.	Names.	Description.							I.—N. Div.—					
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
109	Faust's Winter, *Faust.*	m.	r.	y. r.	g.		W.	Am.						
110	Foundling	m.	r. ob.	y. r.	g. g.	F.	A.	Am.			†	**	*	*
111	Fulton	m.	fl.	g. y.	g.	M.	W.	Am.						
112	Gabriel	m.	r. ob.	r. y.	g.	M.	L. A.	Am.						
113	Garden Royal	m.	r. ob.	y. r.	b.	F.	S.	Am.			*		*	*
114	Garretson's Early	m.	r. c.	y.	g. g.	K.	A.	Am.						
115	Gilpin	s.	r. c.	y. r.	g.	M.	W.	Am.				*		
	Carthouse, Little Romanite.													
116	Goff	l.	fl.	y. r.	v. g.	K. M.	S.	Am.						
117	Golden Ball	l.	r.	y.	g.	F.	E. A.	Am.						
118	Golden Dixie	m.	r. ob.	g. y.	v. g.	F. M.	S.	Am.						
119	Golden Russet of Western New York	m.	r. ob.	y. rus.	v. g.	F. M.	W.		**				**	
120	Golden Sweet	l.	r.	g. y.	v. g.	F. M.	S.	Am.	*				**	*
121	Granite Beauty	l.	r. ob.	y. r.	g.	F. M.	W.	Am.			†	*	*	
122	Gravenstein	l.	r. ob.	y. r.	v. g.	F. M.	L. A.	Ger.	**		**	**	**	**
123	Green Cheese	m.	fl.	g. y.	v. g.	F. M.	W.	Am.						
124	Green Sweet	m.	r. ob.	g. y.	g.	K. M.	W.	Am.						*
125	Grimes' Golden	m.	r. ob.	g. y.	v. g.	F.	W.	Am.	*				*	
126	Gully	m.	fl.	g. y.	v. g.	F.	W.	Am.						
127	Hall	s.	fl.	y. r.	v. g.	F.	W.	Am.						
128	Hamilton	l.	r.	y. r.	g.	F. M.	A.	Am.						
129	Haskell Sweet	m.	fl.	g. y.	v. g.	F.	E. A.	Am.						*
130	Hawthornden	m.	r. ob.	g. y.	g.	K. M.	E. A.	F.				*		
131	Hartford Sweet	l.	r. ob.	r. s.	g.	M.	W.	Am.						
132	Hewes' Crab	s.	r.	y. r.	g.	Cid'r.	L. A.	Am						
	Hewes' Virginia Crab.													
133	Higby Sweet	m.	r. c.	y. r.	v. g.	F.	L. A.	Am						†
134	High Top Sweet	s.	r.	g. y.	v. g.	F. M.	S.	Am.			*		*	*
	Sweet June.													
135	Hockett's Sweet	m.	r. ob.	y. r.	g.	K.	W.	Am.						
136	Holland Pippin	l.	r.	g. y.	g.	K. M.	L. A.	F.					*	
137	Holly	m.	r. ob.	y. r.	g.	K.	W.	Am.						
138	Hoover, *Black Coat*	m.	r.	y. r.	v. g.	F. M.	W.	Am.						
139	Horn	m.	fl.	g. r.	v. g.	F. M.	L. W.	Am						
140	Horse, *Haas*	l.	r.	y. r.	g.	K. M.	S.	Am.		**				
141	Hubbardston	l.	r. c.	y. r.	v. g.	F. M.	W.	Am.	**		**	*	**	**
	Hubbardston Nonsuch.													
142	Hunt Russet	m.	r. ob.	y. rus.	v. g.	F. M.	W.	Am.						**
143	Huntsman's Favorite	l.	ob.	y.	v. g.	F. M.	W.	Am.						
144	Hurlbut	m.	r. ob.	y. r.	g.	F. M.	L. A.	Am.	†		†	*		*
145	Irish Pippin	m.	r.	r. s.	v. g.	F. M.	E. W.	Am.						
146	Jefferson County	m.	r. ob.	y. r.	g.	F. M.	W.	Am.						
147	Jefferis	m.	r. ob.	y. r.	v. g.	F. M.	E. A.	Am.			†			
148	Jersey Sweet	m.	r.	y. r.	v. g.	F. M.	E. A.	Am.					*	
149	Jewett's Red	m.	r. ob.	r.	g.	F. M	W.	Am.	*		**	**	*	
	Jewett's Fine Red.													
150	Jonathan	m.	r. c.	y. r.	v. g.	F. M.	W.	Am.				**	**	*
151	Julian	m.	fl. c.	w. r.	g.	K.	S.	Am.						
152	Junaluskee	m.	r. ob.	g.	v. g.	F. M.	W.	Am.						
153	Kentucky Red	m.	r. c.	g. y. d r	g.	F. M.	A.	Am.						
	Kentucky Red Streak. Bradford's Best.													
154	Kentucky	l.	r. c.	y. r.	g.	M.	L. A.							
155	Keswick Codlin	m.	r. c.	g. y.	g.	K. M.	E. A.	Eng.	*					
156	Key's Fall	m.	r.	rus.	v. g.	F. M.	E. W.	Am.						
157	Kinnaird's Choice	m.	fl.	y. r.	g.	F. M.	W.	Am.						
158	Kinney's Winter						W.							
159	Kirkbridge	m.	ob.	g. y.	g.	K. M.	E. A.							
	Kirkbridge White.													
160	Klaproth	m.	fl.	y. r.	g.	K. M.	E. A.	Am.						
161	Lady Apple	s	fl.	y. r.	v. g.	F. M.	W.	F.						*
162	Lady's Sweet	l	r.	y. r.	v. g.	F. M.	W	Am.				*	*	*
163	Lansingburg	m.	r. fl.	y. r.	g.	M.	W.	Am.						
164	Late Strawberry	m.	r.	y. r.	v. g.	F. M.	L. A.	Am.					*	
	Autumn Strawberry.													
165	Lawyer	l.	r. ob.	y. r.	v. g.	F. M.	W.	Am.						
166	Limber Twig	m.	r. ob.	y. r.	g.	M	W.	Am.						
167	Long Island Russet	m.	r.	rus.		K.	W.	Am.						

113 Of a delicious pear flavor.
122 Ripens early and keeps late.
123 One of the best south.
130 One of the most profitable of market sorts
132 Valued only for cider.
133 A delicious dessert apple.



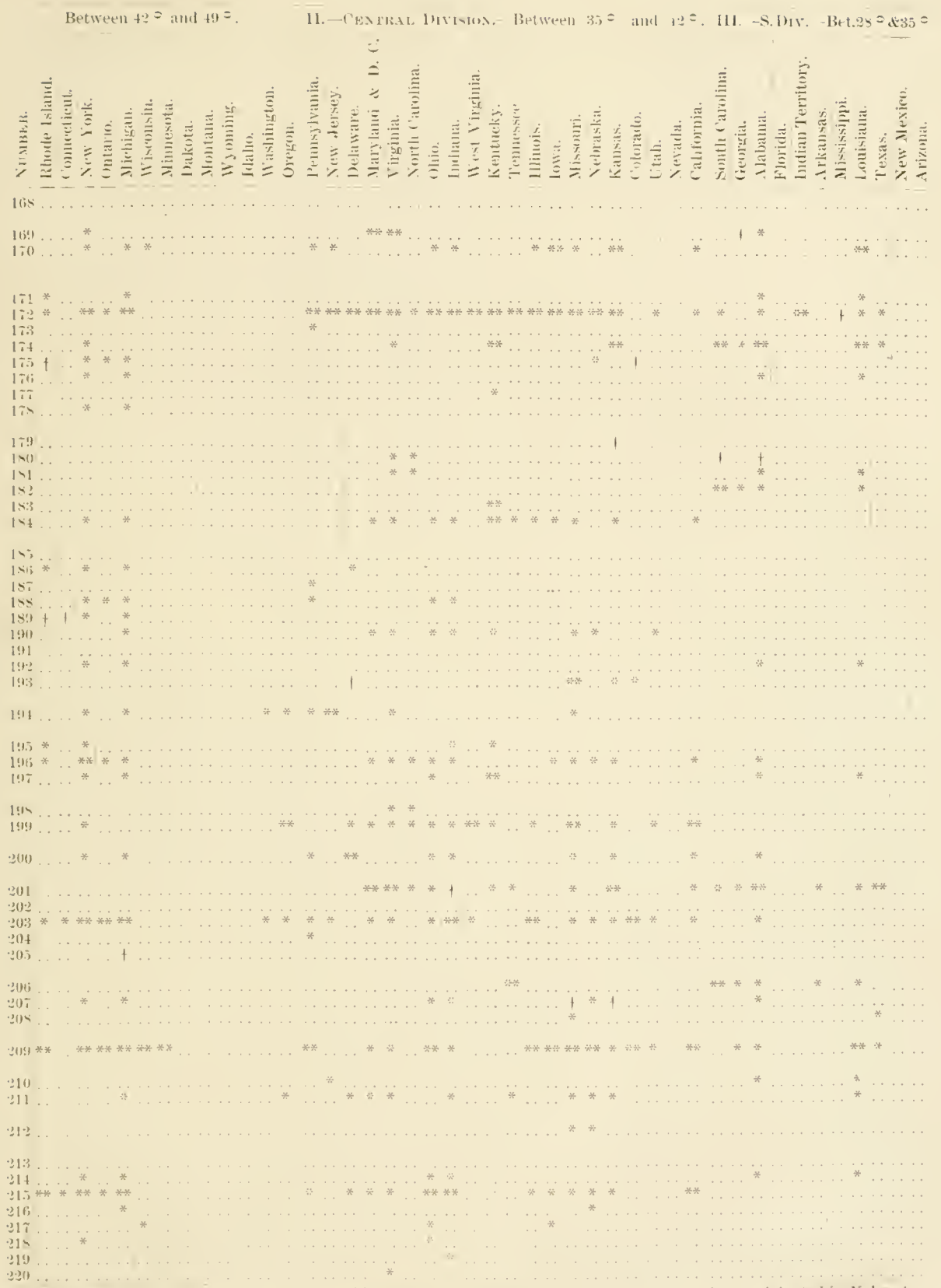
142 A hardy tree and fine fruit Supposed to be identical with Golden Russet of Mass., but not fully decided.

148 Very valuable for market or stock.

166 Hardy and productive Southwest.

Number.	Names.	Description.							I. — N. Div. —					
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
168	Lorne	l.	r. fl.	g. r.	v. g.	F. M.	W.	N. S.	*					
	Marquis of Lorne.													
169	Loudon Pippin	l.	fl.	y. r.	g.	M.	W.	Am.			*			
170	Lowell	l.	r. c.	g. y.	v. g.	F. M.	E. A.	Am.	*					*
	Orange, Tallow Pippin, Queen Anne, Michigan Golden Pippin													
171	Lyscom	l.	r.	g. y.	g.	F. M.	E. A.	Am.	*					*
172	Maiden's Blush	m.	r.	g. y.	g.	K. M.	E. A.	Am.	†			*	*	*
173	Major	l.	r. fl.	g. r.	v. g.	F. M.	W.	Am.						
174	Mangum	m.	r. ob.	y. r.	v. g.	F. M.	W.	Am.						
175	Mann	m.	r. ob.	y. r.	v. g.	F. M.	W.	Am.					†	
176	Manomet	m.	r. ob.	y. r.	v. g.	F. M.	E. A.	Am.						*
177	Mary Womac	l.	r. fl.	y. r.	v. g.	F. M.	W.	Am.						
178	Marston's Red	m.	r. c.	r. s.	v. g.	F.	W.	Am.				*		
	Marston's Red Winter.													
179	Mason's Orange	v. l.	ob.	y.	g.	F. M.	W.	Am.						
180	Mason's Stranger	m.	fl.	y. r.	v. g.	F. M.	W.	Am.						
181	Mattamusket	s.	fl.	y. r.	g.	F. M.	W.	Am.						
182	Maverack Sweet	m.	r. ob.	y. r.	v. g.	M.	W.	Am.						
183	Maxy	m.	r. c.	g. r.	g.	F. M.	W.	Am.						
184	McAfee's Nonsuch	l.	r. ob.	y. r.	v. g.	F. M.	W.	Am.						
	Large Striped Pearmain.													
185	McIntosh Red	m.	r. ob.	y. r	v. g.	F. M.	W.	Am.					†	
186	McLellan	m.	r. ob.	y. r.	v. g.	F. M.	W.	Am.					*	
187	Mellinger	m.	r. c.	r. s.	v. g.	F. M.	E. W.	Am.						
188	Melon	m.	r. ob.	y. r.	b.	F. M.	W.	Am.						*
189	Mexico	m.	r. ob.	r. s.	v. g.	F. M.	A.	Am.						
190	Milam	m.	r.	r. s.	g.	K. M.	W.	Am.						
191	Milden or Milding	l.	fl.	y. r.	v. g.	F. M.	E. W.	Am.				**	*	
192	Minister	l.	ob.	r. s.	g.	K. M.	L. A.	Am.			**	*		*
193	Missouri Pippin	l.	r. ob	y. r.	g.	M.	W.	Am.						
	Missouri Keeper.													
194	Monmouth Pippin	l.	fl.	y. r.	v. g.	F. M.	W.	Am.						
	Red Cheek Pippin.													
195	Moore's Sweet	m.	r. ob.	r.	g.	K.	W.	Am.						
196	Mother	m.	r. c.	y. r.	b.	F. M.	W.	Am.	*		**	**	*	*
197	Munson Sweet	m.	fl.	y. g.	g.	K. M.	L. A.	Am.	*					
	Orange Sweet.													
198	Nansemond Beauty	m.	r. ob.	r. s.	v. g.	F. M.	W.	Am.						
199	Newtown Pippin	l.	r. ob.	g. y.	v. g.	F. M.	W.	Am		†				
	Albemarle Pippin, Brooke's Pippin.													
200	Newtown Spitzenburg	m.	r. ob.	y. r.	b.	F. M.	W.	Am.	†					
	Vandevere, of New York.													
201	Nickajack	l.	r. ob.	r. s.	g.	F. M.	W.	Am.						
202	Nonpareil Russet	m.	r.	y. g.	g.	F. M.	W.	Eng.	*					
203	Northern Spy	l.	r. c.	y. r.	b.	F. M.	W.	Am.	**		**	*	**	*
204	Northampton	m.	fl.	r. s.	v. g.	F.	E. W.	Am.						
205	Oakland	m.	r. ob.	y. r.	v. g.	F.	W.	Am.						
	Oakland County Seek-no-Further.													
206	Oconee Greening	m.	ob.	y.	g.		A.	Am.						
207	Ohio Nonpareil	l.	r. ob.	y. r.	v. g.	F. M.	L. A.	Am.						
208	Ohio Pippin	l.	r. ob.	y. r.	g.		W.	Am.						
	Shannon.													
209	Oldenburg	m.	r. ob.	y. r.	g.	M.	S.	Rus.	*	**	**	**	**	*
	Duchess of Oldenburg.													
210	Orange Pippin	m.	ob.	y.	v. g.	F. M.	A.	Am.						
211	Ortley	m.	ob.	g. y.	v. g.	F. M.	W.	Am.						
	White Bellflower, Woolman's Long.													
212	Otoe Red	m.	r. ob.	y. r.	v. g.	F. M.	W.	Am.						
	Otoe Red Streak.													
213	Peach of Montreal	m.	r. c.	y. s.	v. g.	F. M.	A.	F.						*
214	Peach Pond Sweet	m.	fl.	r. s.	v. g.	F.	A.	Am.						*
215	Peck's Pleasant	m.	r.	g. y.	v. g.	F. M.	W.	Am.	†			†	**	*
216	Perry Russet	m.	r. c.	rus.	g.	F. M.	W.	Am.						
217	Pewaukee	l.	fl.	r. s.	g.	F. M.	W.	Am.		*		†		
218	Phillips' Sweet	m.	r. ob.	r. s.	v. g.	F. M.	W.	Am.						
219	Pickard's Reserve	m.	r. ob.	r. y.	g.	F.	W.	Am.						
220	Pilot	l.	r. ob.	g. y. r.	v. g.	F. M.	W.	Am.						

172 A profitable market sort.
176 A valued sweet apple.
177 A seedling from Rambo, which it resembles.
188 One of the most delicious apples; tree a poor grower.
196 Esteemed where known.
201 This apple is known in South and West by over forty different names.



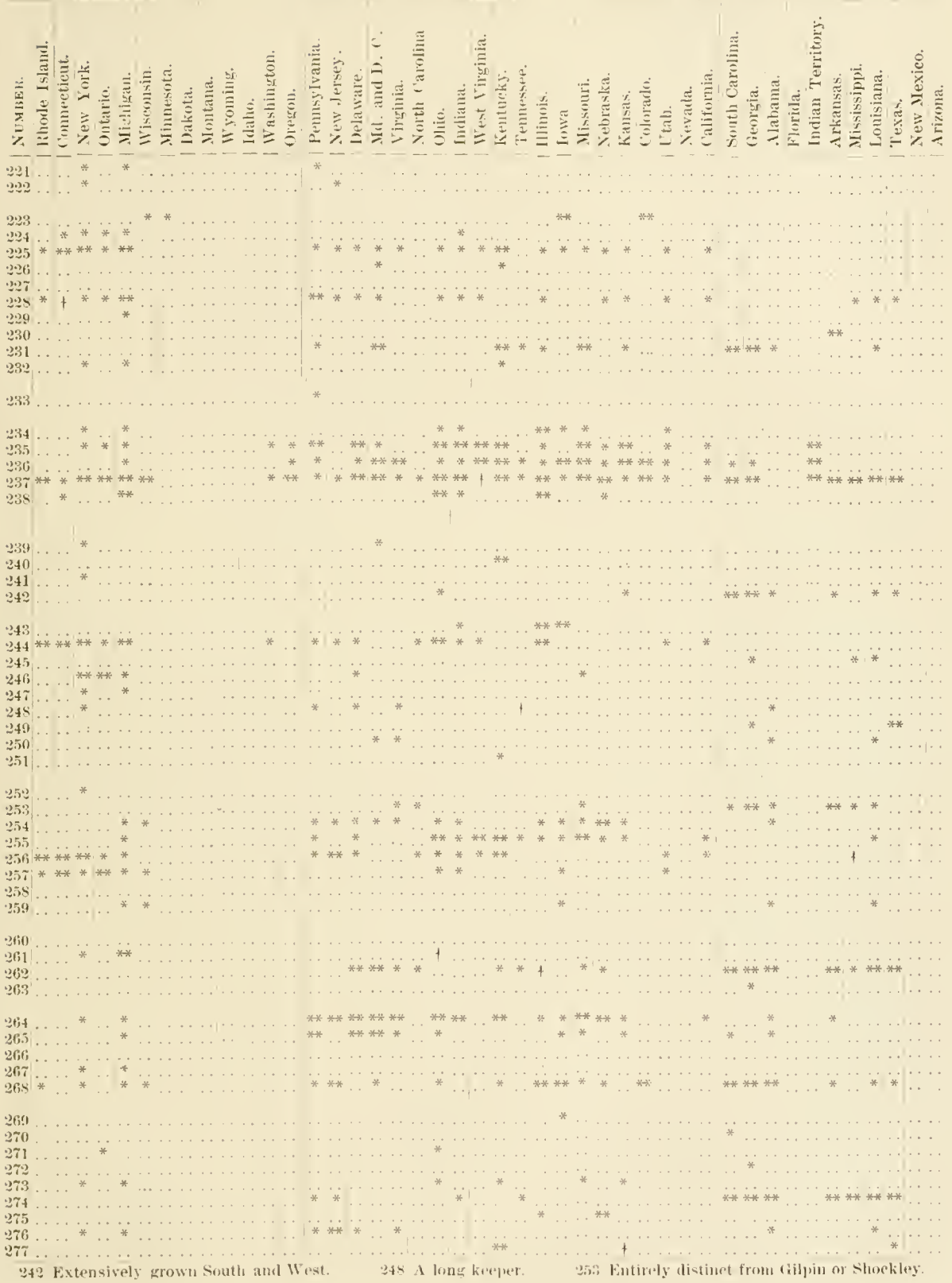
207 Esteemed where known.
209 One of the most hardy varieties.
211 An old variety: extensively planted at the West 25 or more years since.
212 A new variety: originated in Nebraska
217 Very hardy.

Number.	Names.	Description.							I.—N. Div.—					
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
221	Pittsburg Pippin	l.	fl.	g. y.	v. g.	F. M.	W.	Am.	.					
222	Pleasant Valley	m.	r. ob.	g. y.	v. g.	F. M.	W.	Am.						
	Pleasant Valley Pippin.													
223	Plumb's Cider	m.	r. c.	g. y. r.	g.	K. M.	A.	Am.						
224	Pomme Grise	s.	r. ob.	y. rus.	b.	F.	W.	F.	*	*			*	
225	Porter	l.	ob.	g. y.	b.	F. M.	A.	Am.	*		**	**	**	**
226	Premium	m.	r. c.	y.	v. g.	F. M.	E. W.	Am.						
227	President	l.	r. ob.	y.	g.	F.	A.	Am.			*			
228	Primate	m.	r. c.	g. y.	b.	F.	E. A.	Am.	*		*	*		*
229	Progress	m.	r. ob.	y.	g.	F. M.	W.	Am.						
230	Prother's Winter	m.	c.	y. r.	g.	F. M.	L. W.	Am.						
231	Pryor's Red	l.	r. ob.	y. r.	v. g.	F. M.	W.							
232	Pumpkin Sweet	l.	r. obl.	y.	g.	K. M.	E. W.	Am.		*	*		*	*
	Lyman's Pumpkin Sweet, Pound Sweet.													
233	Pyle's Winter	l.	r. ob.	r. s.	v. g.	F. M.	W.	Am.						
	Pyle's Red Winter.													
234	Ramsdell's Sweet	m.	ob.	y. r.	g.	K. M.	L. A.				*	*		
235	Rambo	m.	fl.	y. r.	v. g.	F. M.	L. A.	Am.					*	
236	Rawle's Genet	l.	r. c.	y. r.	v. g.	F. M.	W.							
237	Red Astrachan	l.	r.	y. r.	g.	K. M.	S.	F.	**	**	**	**	**	**
238	Red Canada	m.	r. ob.	y. r.	b.	F. M.	W.				**	*		*
	Old Nonsuch, Richfield Nonsuch, Steele's Red Winter of Some.													
239	Red Cathead	l.	r. c.	y. r.	g.	F. M.	L. A.	Am.						
240	Red Crab	s.	r.	r.		Cid'r.	L. A.	Am.						
241	Red Rance	m.	r. ob.	r. s.	v. g.	F. M.	E. W.	Am.						
242	Red Winter Pearmain	m.	r. ob.	y. r.	g.	F. M.	W.	Am.						
	Bumcombe.													
243	Red Stripe	m.	ob. c.	y. r.	g.	K. M.	S.	Am.						
244	Rhode Island Greening	l.	r. ob.	g. y.	v. g.	F. M.	W.	Am.	*	*	**	**	**	**
245	Rhode's Orange	m.	r. ob.	y. r.	g.	F.	S.	Am.						
246	Ribston Pippin	m.	r.	y. r.	v. g.	F. M.	W.	Eng.	**	*	*		*	
247	Richard's Graft	m.	r. ob.	r. s.	v. g.	F. M.	E. A.	Am.						
248	Ridge Pippin	l.	r. c.	y. rus.	g.	M.	W.	Am.						
249	Robinson's Superb	l.			g.	F. M.	A.	Am						
250	Robertson's White	m.	r. ob.	g. y.	g.	F. M.	L. A.	Am.						
251	Rock Pippin	m.	c.	y.		M.	W.	Am.						
	Lemon.													
252	Rockport Sweet	m.	r. ob.	g. y.	v. g.	F.	W.	Am.						*
253	Romanite, of the South	s.	r. c.	y. r.	v. g.	F. M.	W.	Am.						
254	Roman Stem	m	r.	y. rus.	v. g.	F. M.	W.	Am.						
255	Rome Beauty	l	r.	y. r.	g.	M.	L. A.	Am						
256	Roxbury Russet	m.	r. ob.	y. rus.	v. g.	F. M.	W.	Am.	*		*	**	*	**
257	Saint Lawrence	l.	fl.	y. r.	v. g.	M.	A.		**	*		*	*	*
258	Sarah	l.	fl.	r. s.	v. g.	F. M.	E. A.	Am.			*			
259	Saxton	m.	r. ob.	y. r.	g.	F.	A.	Am.						
	Fall Stripe.													
260	Sheppard's Sweet	m.	r. c.	r. s.	g.	F.	L. A.	Am.						
261	Shiawassee Beauty	m.	fl.	r. y.	v. g.	F. M	W.	Am.						
262	Shockley	s.	r. c.	y. r.	g.	F. M.	W.	Am						
263	Simmons' Red	m.	ob.	y. r.	v. g.		S.	Am.						
	Red Everlasting.													
264	Smith's Cider	l.	r. ob.	y. r.	g.	F. M.	W.	Am.						
265	Smokehouse	l.	r. ob.	y. r.	g.	K. M.	W.	Am.						
266	Somerset, of Maine	m.	fl.	r. s.	v. g.	F.	S.	Am.			*			
267	Somerset, of New York	s	r. c.	y. rus.	v. g.	F.	E. A.	Am.						
268	Sops of Wine	m.	r.	y. r.	g.	K. M.	E. A.	Eng.		*	**	*		*
	Hominy.													
269	Soulard	m.	r. ob.	y. r.	g.	M.	L. A.							
270	Southern Porter	m.	r. c.	y.	v. g.	F. M.	S.	Am						
271	Spice Russet	s.	fl. c.	y. rus.	v. g.	F.	W.	Am.						
272	Stansill	m.	r. ob.	g. y.	g.	F.	W	Am.						
273	Stark	l.	r. c.	y. r.	g.	F.	W.	Am.	*					
274	Stevenson's Winter	m.	r. ob.	y.	g.	F.	W.	Am.						
275	Summer Bellefleur	m.	c.	y.	g.	F. M.	A.	Am.						
276	Summer Hagloe	l.	r. ob.	r. s.	v. g.	K. M.	S.	Am.						
277	Summer King	m.	fl.	y. r.	g.	F. M.	S.	Am.						

224 A tree of small growth; succeeds well at the north.

230 Valued chiefly for its keeping qualities.

240 Best of all for cider.



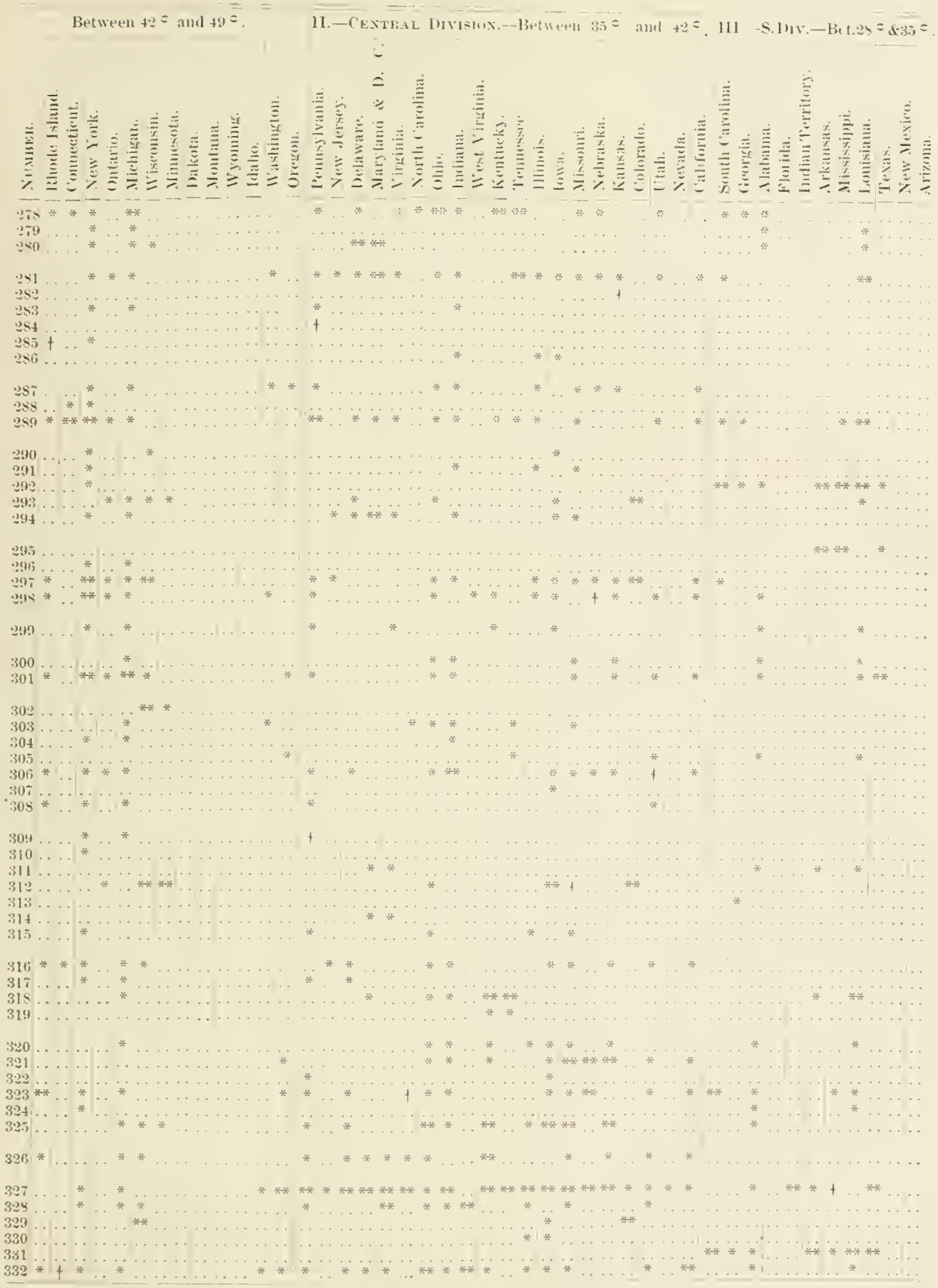
242 Extensively grown South and West.

248 A long keeper.

253 Entirely distinct from Gilpin or Shockley.

Number.	Names.	Description.							I.—N. Div.—					
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
278	Summer Queen	l.	r. c.	y. r.	g.	K. M.	S.	Am.						
279	Summer Pound Royal	l.	r. c.	y. rus.	g.	M.	E. A.	Am.						
280	Summer Pippin	m.	ob. c.	y. r.	g.	K. M.	L. S.	Am.				*	*	
	Champlain Nyack.													
281	Summer Rose	s.	r.	y. r.	b.	F.	S.	Am.					*	*
282	Summer Seek-no-further	m.	ob. c.	y.	v. g.	F. M.	S.	Am.						
283	Summer Sweet Paradise	l.	r.	g. y.	v. g.	F.	E. A.	Am.			†			
284	Susan's Spice	m.	fl.	y. r.	g.	F.	A.	Am.						
285	Sutton Beauty	m.	r. ob.	r. s.	v. g.	F. M.	E. W.	Am.						*
286	Striped Sweet	l.	r. ob.	r. s.	v. g.	F. M.	E. W.	Am.						
	Striped Sweet Pippin.													
287	Swaar	l.	r. ob.	g. y.	b.	F. M.	W.	Am.			†			
288	Sweet Belle et Bonne	m.	r. ob.	y. rus.	v. g.	F.	E. W.	Am.						
289	Sweet Bough	l.	ob.	g. y.	v. g.	F. M.	S.	Am.	**		*	*	*	**
	Large Yellow Bough.													
290	Sweet Pear	m.	r. c.	y.	v. g.	F.	A.	Am.						
291	Sweet Winesap	m.	fl.	r. s.	v. g.	M.	W.	Am.						
292	Taunton	l.	r. c.	y. r.	g.	F. M.	A.	Am.						
293	Tetofsky	m.	fl. c.	y. r.	g.	K.	S.	Rus.			**	*	*	
294	Tewksbury Winter	s.	fl.	y. r.	v. g.	F. M.	W.	Am.						
	Tewksbury Winter Blush.													
295	Titlaquah	m.	r. fl.	y. r.	g.	F. M.	W.	Am.						
296	Tinmouth	m.	fl.	y. r.	v. g.	F.	W.	Am.					*	
297	Talman Sweet	m.	r.	g. y.	v. g.	K. M.	W.	Am.	*	*	**	**	**	**
298	Tompkins King	l.	r.	y. r.	v. g.	F. M.	W.	Am.	**		*	*	*	*
	King of Tompkins County.													
299	Townsend	m.	r. ob.	r. s.	g.	M.	S.	Am.						
	Hocking.													
300	Trenton Early	m.	r.	y.	g.	F.	S.	Am.						
301	Twenty Ounce	l.	r.	r. s.	v. g.	F. M.	L. A.	Am.	*		†	*	†	*
	Twenty Ounce Apple, Cayuga Red Streak.													
302	Utter	m.	r. ob.	r. s.	g.	F. K.	A.	Am.						
303	Vandevere	m.	fl.	y. r.	g.	M.	W.	Am.						
304	Victuals and Drink	l.	ob.	y. rus.	g.	F.	W.							
305	Virginia Greening	l.	fl.	g. y.	g.	M.	W.	Am.						
306	Wagener	m.	r. ob.	y. r.	b.	F.	W.	Am.	*		*	*	*	*
307	Warfield	l.	fl.	y.	g.	F. M.	A.	Am.						
308	Washington	l.	r. c.	y. r.	v. g.	F. M.	E. A.	Am.			*			**
	Washington Strawberry.													
309	Washington Royal	m.	r. ob.	g. y.	g.	M.	W.	Am.						
310	Water	m.	r. c.	y. r.	v. g.	F.	E. W.	Am						
311	Waugh's Crab	s.	r. c.	r. s.	g.	Cider.	W.	Am.						
312	Wealthy	m.	r. ob.	r.	v. g.	F. M.	W.	Am.	*	**			**	
313	Webb's Winter	m.	r.	y.	g.	F.	W.	Am.						
314	Wellford's Yellow	s.	r. ob.	g. y.	g.	M.	W.	Am.						
315	Western Beauty	l.	r. ob.	r. s.	v. g.	F. M.	S.	Am.						
	Grosh, Summer Rambo, Etc.													
316	Westfield Seek-no-further	l.	r. c.	y. r.	b.	F. M.	W.	Am.	*				*	*
317	White Doctor	l.	r. ob.	g. y.	g.	K. M.	E. A.	Am.						
318	White Juneating, May, Early May, Etc	s.	r.	g. y.	g.	F. M.	S.	F.						
319	White Paradise	m.	r. fl.	y. r.	g.	M.	W.	Am.						
	Lady Finger.													
320	White Pippin	l.	r. ob.	g. y.	v. g.	F. M.	W.	Am.						
321	White Winter Pearmain	m.	r. c.	y. r.	v. g.	F. M.	W.	Am.						
322	White Rambo	m.	r. ob.	g. y.	g.	M.	L. A.	Am.						
323	Williams' Favorite	m.	r. c.	y. r.	g.	M.	S.	Am.	*		**	**	**	**
324	Willis Sweet	l.	r.	y. r.	v. g.	K. M.	S.	Am.						
325	Willow Twig	m.	r. c.	y. r.	g.	K. M.	W.	Am.						
	James River.													
326	Wine	l.	r.	y. r.	v. g.	F. M.	W.	Am.						
	Hay's Wine, Pennsylvania Red Streak.													
327	Winesap	m.	r.	y. r.	v. g.	F. M.	W.	Am.						*
328	Winter Sweet Paradise	l.	r. ob.	g. y.	v. g.	F.	W.	Am.						
329	Wolf River	l.	r. ob.	r.	g.	F. M.	W.	Am.						
330	Wythe	m.	fl.	r. s.	v. g.	F.	W.	Am.						
331	Yates	s.	fl.	y. r.	g.	F. M.	W.	Am.						
332	Yellow Bellefleur	l.	ob.	g. y.	v. g.	F. M.	W.	Am.	**		*	*	*	*

325 Valuable for late keeping.


Between 42° and 49°.
II.—Central Division.—Between 35° and 42°.
III.—S. Div.—Bet. 28° & 35°.
Number.
Rhode Island.
Connecticut.
New York.
Ontario.
Michigan.
Wisconsin.
Minnesota.
Dakota.
Montana.
Wyoming.
Idaho.
Washington.
Oregon.
Pennsylvania.
New Jersey.
Delaware.
Maryland & D. C.
Virginia.
North Carolina.
Ohio.
Indiana.
West Virginia.
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Tennessee
Illinois.
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Missouri.
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Kansas.
Colorado.
Utah.
Nevada.
California.
South Carolina.
Georgia.
Alabama.
Florida.
Indian Territory.
Arkansas.
Mississippi.
Louisiana.
Texas.
New Mexico.
Arizona.

Number.	NAMES.	DESCRIPTION.							I.—N. Div.—					
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
333	Yellow June	m.	r. ob.	y.	g.	F.	S.	Am.						
	Nantahalee.													
334	Yellow Transparent	m.	r. ob.	y.	g.		E. S.	Rus.					*	
335	York Imperial	l.	fl.	y. r.	g. g.	F. M.	W.	Am.						
336	Yopp's Favorite	l.	r. c.	y.	g.	F.	A.	Am.						
337	Zachary Pippin	l.	fl.	r. s.	v. g.	F. M.	E. W.	Am.				*		

II.—APPLES—CRABS.

Number.	NAMES.	DESCRIPTION.							I. —N. Div.—					
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Beecher Sweet	m.	r.	r.	v. g.	F. M.	E. A.	Am.						
2	Brier Sweet (of Wisconsin)	l.		r. y.	v. g.	F. M.	A.	Am.						
3	Byer's Beauty	s	r. fl.	r.	g.	F. M.	E. A.	Am.						
4	Cherry	s.	r.	y. r.	g.	K.	A.	F.						
5	Conical	m.	c.	r.	v. g.	F. M.	L. A.	Am						
6	Early Strawberry	m.	r.	r. s.	g.	F.	S.	Am.						
7	Glover's Early							Am.						
8	Hyslop	l.	r.	r.	g.	F. M	A.	Am.	*	**	*	*		
9	Lady Elgin	l.	r. ob.	y. r.	v. g.	F. M.	L. A.	Am.						
10	Lake Winter	l.	r.	r. y.	v. g.	F.	W.	Am.						
11	Marengo	l.	r. fl.	y. r.	g.	F. M.	W.	Am.			†			
12	Minnesota	v. l.	ob.	y. r.	v. g.	F. M.	L. A.	Am.						
13	Montreal Beauty	l.	r. ob.	y. r.	g.	F. M.	A.	Am	*		†			
14	Orange	m.	r.	o.	g.	F. M.	L. A.	Am.						
15	Orion	l.	ob.	r. s.	g.	F. M.	L. A.	Am.						
16	Red Siberian	m.	r.	r.	g.	F. M.	A.	F.				*		
17	Spitzenberg							Am.						
18	Sweet Russet	l.	r. c.	y. rns.	b.	F.	E. A	Am.						
19	Sylvan Sweet	l.	r. fl.	y. r.	g.	F. M.	A.	Am.				*		
20	Transcendent	l.	r. ob.	y. r.	g.	F. M.	A.	Am.	*	**	**			
21	Whitney	l.	r. fl.	r.	v. g.	M.	S.	Am.						
22	Yellow Siberian	m.	r.	y.	g.	F. M.	A.	F.						

	Between 42° and 49°.												II.—Central Division.—Between 35° and 42°.														III—S. Div.—28° and 35°.								
Number.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Md. and D. C.	Virginia.	North Carolina	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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II.—APPLES—CRABS.

	Between 42° and 49°.												II.—Central Division.—Between 35° and 42°.														III—S. Div.—28° and 35°.								
Number.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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III.—APRICOTS.

The columns explain as follows: SIZE—l., large; m., medium; s., small. FORM—r., roundish; r. f., roundish flattened; r. o., roundish oval; ob. c., oblong compressed. COLOR—y. o., yellow, shaded to deep orange in the sun; o. r., orange, with a red cheek; o., orange. QUALITY—g., good; v. g., very good; b., best. USE—All apricots being valued for the dessert, the letter F. will signify that it is extra for the dessert, and F. M. that it is valued for the dessert and at the same time profitable for market. SEASON—E., early; M., medium; L., late in season of ripening. ORIGIN—F., foreign; Am. American.

NUMBER.	NAMES.	DESCRIPTION.							I.—N. DIV.—					
		SIZE.	FORM.	COLOR.	QUALITY.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Breda	m.	r.	o.	v. g.	F. M.	E.	F.						
2	Early Golden	s.	r. o.	o.	v. g.	F. M.	E.	Am.						
3	Hemskirk	l.	r. f.	o. r.	b.	F. M.	M.	F.						
4	Large Early	m.	ob. c.	o. r.	b.	F.	E.	F.	*					
5	Large Red	l	r. o.	o. r.	b.	F.	M.	F.						
6	Moorpark	l.	r.	y. o.	b.	F. M.	L.	F.						
7	Musch Musch	s.	r.	y.	g.	F.	E.	F.						
8	Orange	m.	r.	o. r.	g	F.	M.	F.						
9	Peach	l.	r. f.	y. o.	b.	F. M.	L.	F.						
10	Red Masculine	s.	r.	y. o.	v. g.	F. M.	M.	F.						
11	Royal	l.	r. o.	y. r.	v. g.	F. M.	M.	F.						
12	St. Ambroise	l.	r. f.	y. o	b.	F	M.	F.						
13	Turkey	m	r.	y. o.	v. g.	F. M	L.	F.						

IV.—BLACKBERRIES.

These columns explain as follows: SIZE—l., large; m., medium; s., small. FORM—ob. c., oblong conic; r. c., roundish conical or oval; ob. ov., oblong oval. COLOR—b., black. QUALITY—g., good; v. g., very good; b., best. USE—F. M., family and market; M., market. SEASON—M., medium; E., early; L., late. ORIGIN—Am., American; F., Foreign.

NUMBER.	NAMES.	DESCRIPTION.							I.—N. DIV.—					
		SIZE.	FORM.	COLOR.	QUALITY	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Ancient Briton	l.	ob. ov.	b.	v. g.	F. M.	M.	Am.						*
2	Barnard	l.	ob. ov.	b.	v. g.	F. M.	M.	Am.						
3	Brunton's Early	m.		b.	g.	F. M.	V. E.	Am.						
4	Dorchester	m.	ob. c.	b.	b.	F.	M.	Am.	*		*		*	**
5	Early Harvest	m.	ov.	b.	g.	F. M.	V. E	Am.						
6	Kittatinny	l.	r. c.	b.	b.	F. M.	M.	Am.	*		*		*	*
7	New Rochelle, or Lawton	l.	ov.	b.	g.	M.	L.	Am.			*		*	*
8	Sable Queen												*	
9	Snyder	m.	r. ov.	b.	v. g.	F. M.	E.	Am.					*	*
10	Stone's Hardy	l.	ob.	b.	g.	F.		Am.						
11	Taylor. *Taylor's Prolific.*	l.		b.	g.	F. M.		Am.					*	*
12	Wachusett	m.	ob. ov.	b.	v. g.	F. M.	M.	Am.						*
13	Western Triumph	m.		b.	g.	F. M.		Am.					*	
14	Wilson's Early	l.	ob. ov.	b.	v. g.	M.	E.	Am.	*		*			*
15	Wilson Junior	l.	ob. ov.	b.	v. g.	M.	E.	Am						

4 Of fine flavor. 6 Rusts badly in many places. 12 Almost thornless and valued on that account.

III.—APRICOTS

The columns explain as follows: SIZE—l., large; m., medium; s., small. FORM—r., roundish; r. f., roundish flattened; r. o., roundish oval; ob. c., oblong compressed. COLOR—y. o., yellow, shaded to deep orange in the sun; o. r., orange, with a red cheek; o., orange. QUALITY—g., good; v. g., very good; b., best. USE—All apricots being valued for the dessert, the letter F. will signify that it is extra for the dessert, and F. M. that it is valued for the dessert and at the same time profitable for market. SEASON—E., early; M., medium; L., late in season of ripening. ORIGIN—F., foreign; Am., American.

	Between 42° and 49°.													II.—CENTRAL DIVISION.—Between 35° and 42°.															III—S. DIV.—28° and 35°.									
NUMBER.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Md. and D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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IV.—BLACKBERRIES.

The columns explain as follows: SIZE—l., large; m., medium; s., small. FORM—ob. c., oblong conic; r. c., roundish conical or oval; ob. ov., oblong oval. COLOR—b., black. QUALITY—g., good; v. g., very good; b., best. USE—F. M., family and market; M., market. SEASON—M., medium; E., early; L., late. ORIGIN—Am., American; F., Foreign.

	Between 42° and 49°.													II.—CENTRAL DIVISION.—Between 35° and 42°.															III—S. DIV.—28° and 35°									
NUMBER.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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V.—CHERRIES.

The columns explain as follows: SIZE—l., large; m., medium; s., small. FORM—ob. h., obtuse heart shape; r. ob. h., roundish obtuse heart shape; r. h., roundish heart shape; r., roundish, or round. COLOR—l. r., lively bright red; d. r., dark red, almost black; a. m., amber mottled with red; y. r., yellow ground shaded and marbled with red. CLASS—H., Hearts, or tender fleshed sweet cherries; B., Bigarreau, or firm fleshed cherries; D., Dukes, having a character in tree and fruit midway between the Hearts and Morellos; M., Morellos, having acid fruit and the tree of small, slender growth. USE—F., family, for dessert; F. M., family or market; K. M., for cooking or market; M., market. SEASON—E., early; M., medium; L., late. ORIGIN—F., foreign; AM., American.

NUMBER.	NAMES.	DESCRIPTION.							I.—N. DIV.—					
		SIZE.	FORM.	COLOR.	CLASS.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Arch Duke	l.	ob. h.	d. r.	D.	K. M.	L.	F.					*	..
2	Belle Magnifique	l.	r. h.	l. r.	D.	K. M.	L.	F.				*	*	..
3	Belle de Choisy	m.	r.	a. m.	D.	F.	M.	F.	*	..	*	..	*	..
4	Belle d'Orleans	m.	r. h.	y. r.	H.	F. M.	E.	F.						*
5	Bigarreau	l.	ob. h.	y. r.	B.	F. M.	M.	F.	**				*	*
	Graffion, Yellow Spanish.													
6	Black Eagle	l.	ob. h.	d. r.	B.	F. M.	M.	F.					*	**
7	Black Heart	l.	r. h.	d. r.	H.	F. M.	M.	F.	*	..	*	..	*	*
8	Black Republican, *Luelling*	l.	r. h.	b.	G.	F. M.	....	Am.						..
9	Black Tartarian	l.	r. h.	d. r.	H.	F. M.	M.	F	*	..	*	..	*	**
10	Buttner's Yellow	m.	r.	y.	G.	F. M.	L.	F					*	..
11	Carnation	m.	r.	a. m.	D.	K. M	L.	F						..
12	Coe's Transparent	m.	r.	a. m.	H.	F.	M.	Am.			*			**
13	Donna Maria	m.	r.	d. r.	M.	K. M.	L.	F.						..
14	Downer's Late	m.	r. h.	y. r.	H.	F. M.	L.	Am.	*				*	**
15	Early Purple, *Early Purple Guigne*	m.	r. h.	d. r.	H	F. M.	E.	F.	*	..	*	..	*	*
16	Early Richmond	s.	r.	l. r.	M.	K. M.	E.	F.	*	..	*	..	**	*
17	Elton	l.	r. h.	y. r.	B	F. M	M	F.			*	..	*	*
18	Eugenie, *Empress Eugenie*	m.	r. ob. h.	d. r.	D.	F. M.	M.	F.						..
19	Florence	l.	h.	y. r.	B.	K. M.	L.	F.						..
20	Governor Wood	l.	r. h.	y. r.	H.	F. M.	M.	Am.	*				*	*
21	Hovey	l.	r. h	y r.	B.	F. M.	M.	Am.						*
22	Knight's Early, *Knight's Early Black*	l.	ob. h.	d. r.	H.	F. M.	E.	F.						*
23	Late Duke	l.	ob. h.	d. r.	D.	K. M.	L.					*	**	*
24	Late Kentish	m.	r.	r.	G.	K.	M.	F.					*	..
25	Louis Phillippe	l.	r.	d. r.	D.	K. M.	L.	F.				*		
26	Mezel, *Bigarreau of Mezel*	l.	ob. h.	d. r.	B.	F. M.	M.	F.						*
	Monstrueuse Mezel, Bigarreau Gaubalis.													
27	May Duke	l.	r. ob. h.	d. r.	D.	K. M.	E.	F.	*	..	*	..	**	*
28	Montmorency Large	l.	r.	d. r.	M.	K. M.	M.	F.						..
29	Morello	l.	r. h.	d. r.	M.	K. M.	L.	F.	*	..	*	..	**	..
	English Morello, Large Morello.													
30	Napoleon	l.	r. ob. h.	y. r.	B.	F. M.	M	F.			*	..	*	
	Royal Ann. in California and Oregon.													
31	Osceola	l.	r. h.	d. r.	H.	F. M.	M.	Am.						†
32	Ohio Beauty	l.	ob. h.	y. r.	H.	F. M.	M.	Am.						†
33	Olivet	l.	r.	l.	D.	F.	M.	F.						..
34	Plumstone Morello	l.	r.	d. r.	M.	K. M.	L.	F.						..
35	Pontiac	l.	ob. h.	d. r.	H.	F. M.	M.	Am.						†
36	Red Jacket	l.	ob. h.	y. r.	H.	F. M.	L.	Am.						**
37	Reine Hortense	l.	r.	l. r	D.	F. M.	L.	F.			*	..	*	*
38	Rockport	l.	r. ob. h.	a. m.	B.	F. M.	E.	Am.						*
39	Royal Duke	l.	r.	d. r.	D.	K. M.	M.	F.						..
40	Tecumseh	m.	ob. h.	d. r.	H.	M.	L.	Am.						..
41	Windsor	l.	r. h.	d. r.	B.	M.	L.	Am.						*

7 A fine old variety, but by many supposed to be superseded

13 Very hardy and productive.

16 Believed by many to be identical with Early May of the West: not fully settled.

V.—CHERRIES.

The columns explain as follows: Size—l., large; m., medium; s., small. Form—ob. h., obtuse heart shape; r. ob. h., roundish obtuse heart shape; r. h., roundish heart shape; r., roundish, or round. Color—l. r., lively bright red; d. r., dark red, almost black; a. m., amber mottled with red; y. r., yellow ground shaded and marbled with red. Class—H., Hearts, or tender fleshed sweet cherries; B., Bigarreau, or firm fleshed cherries; D., Dukes, having a character in tree and fruit midway between the Hearts and Morellos; M., Morellos, having acid fruit, and the tree of small, slender growth. Use—F., family, for dessert; F. M., family or market; K. M., for cooking or market; M., market. Season—E., early; M., medium; L., late. Origin—F., foreign; Am., American.

	Between 42° and 49°.													II.—Central Division.—Between 35° and 42°.																	III.—S. Div.—Bet. 28° & 35°						
Number.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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25. An old excellent sort; little known.

36. The latest ripening large sweet cherry.

VI.—CURRANTS.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—with reference to form of bunch—l., long; v. l., very long; s., short; m., medium. COLOR—r., red; b., black; w., white. QUALITY—a., acid; m. a., moderately acid; v. a., very acid. USE—K. M., kitchen and market; F. M., family and market; M., market. SEASON—E., early; M., medium; L., late. ORIGIN—F., foreign.

NUMBER.	NAMES	DESCRIPTION.							I.—N. DIV.					
		SIZE.	FORM.	COLOR.	QUALITY.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Angers, *Fertile d'Angers*	l.	l.	r.	m. a.	F. M.	M.	F.					*	
2	Black Naples	l.	s.	b.	m. a.	K. M.	M.	F.	*		*	*	*	*
3	Cherry	l.	s.	r	v. a.	M.	M	F.	*		*	**	*	**
4	Common Black	s.	s.	b.	m. a.	K. M.	M.	F						
	Black English.													
5	Fay's Prolific	l.	l.	r.	m. a.	F. M	M.	Am.						†
6	Knight's Red, *Knight's Large Red*	l.	m.	r.	m. a.	F.	M.	F.					*	
7	Lee's Prolific	l.	l.	b.	m. a.	K. M.	M.	F.						*
8	Palluau, *Fertile de Palluau*	l.	l.	r.	a.	F. M.	M.	F.					*	
9	Prince Albert	l	l.	r.	m. a.	M.	L.	F.						
10	Red Dutch	m.	m.	r.	m. a.	F. M.	E.	F.	*			**	*	*
11	Red Grape	m.	m.	r.	m. a.	F. M.	E.	F.						
12	Versaillaise, *La Versaillaise*	l.	s.	r.	a.	M.	M.	F.	*		**	**	*	**
13	Victoria	l.	v. l.	r.	a.	F. M.	L.	F.					*	
	Ruby Castle.													
14	White Dutch	m.	l.	w.	m. a.	F. M.	E.	F.	*				*	*
15	White Grape	m.	l.	w.	m. a.	F. M.	E.	F.	*		*		*	

VII.—GOOSEBERRIES.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—r., round; o., oval; r. o., roundish oval. COLOR—r., reddish, when fully ripe; g., greenish yellow, when fully ripe. QUALITY—g., good; v. g., very good; b., best USE—K., kitchen; M., market. SEASON—E., early; M., medium; M. L., medium late. ORIGIN—Am., American; F., foreign.

NUMBER.	NAMES.	DESCRIPTION.							I.—N. DIV.—					
		SIZE.	FORM.	COLOR.	QUALITY.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Crown Bob	l.	o. b.	r.	v. g.	K. M.	M.	F.	*				*	
2	Downing	m.	r. o.	g.	v. g.	K.	M. L.	Am.			*		*	**
3	Houghton	s.	r. o.	r.	g.	K. M.	E.	Am.	*		**	*	*	*
4	Mountain	l.	o.	r.	g	M.	M.	Am.				*	*	
5	Orange	m.	r.	y.	g.	K. M.	E.	Am						
6	Pale Red	m.	r. o.	r.	v. g.	K. M.	E.	Am.						
	Cluster, American Seedling.													
7	Roaring Lion	l.	o. b.	r.	v. g.	K. M.	M.	F.	*				*	
8	Smith's, *Smith's Improved*	l.	o.	g.	v. g.	K. M.	M.	Am.			*		*	**
9	Whitesmith	l.	o.	g.	v. g.	K. M.	M.	F.	*					

2 A little liable to sunburn or blister.

4 A strong growing bush—berry with a very thick skin.

6 An old sort, entirely free from mildew—more upright, than Houghton.

VI.—CURRANTS.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—with reference to form of bunch—l. long; v. l., very long; s., short; m., medium. COLOR—r., red; b., black; w., white. QUALITY—a., acid; m., moderately acid; v. a., very acid. USE—K. M., kitchen and market; F. M., family and market; M., market. SEASON—E., early; M., medium; L., late. ORIGIN—F., foreign.

	Between 42° and 49°.													II.—CENTRAL DIVISION.—Between 35° and 42°.																III—S. DIV.—28° and 35°.								
NUMBER.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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15	*	*	**	*	**	*	*						*	**	*	*	*			*	*		*	*		*	*	*	**	*			*								

VII.—GOOSEBERRIES.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—r., round; o., oval; r. o., roundish oval. COLOR—r., reddish, when fully ripe; g., greenish yellow, when fully ripe. QUALITY—g., good; v. g., very good; b., best USE—K., kitchen; M., market. SEASON—E., early; M., medium; M. L., medium late. ORIGIN—Am., American; F., foreign.

	Between 42° and 49°.													II.—CENTRAL DIVISION.—Between 35° and 42°.																III—S. DIV.—28° and 35°.								
NUMBER.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Md. and D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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9			*											*				*		*								**		*											

8 New and promising.

9 One of the best of all the foreign large sorts in its immunity from mildew.

VIII.—GRAPES, NATIVE.

The columns explain as follows: SIZE—with reference to the berry, l., large; m., medium; s., small. FORM—with reference to bunch and berry, s. r., short bunch, round berry; l. r., large and round; m. r. o., medium bunch, roundish oval berry; m. r., medium bunch, round berry. COLOR—b., black or nearly so when fully ripe; r., reddish or coppery-brownish red; g., greenish white or yellowish. QUALITY—g., good; v. g., very good; b., best. USE—T., table, M., market; W., wine. SEASON—E., early; M., medium; L., late. ORIGIN—See next page.

NUMBER.	NAMES.	DESCRIPTION.							I.—N. DIV.—					
		SIZE.	FORM.	COLOR.	QUALITY.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Agawam, *Rogers' No. 15*	l.	s. r. o.	r.	g.	T. M.	M.	Hyb.	*		**	*	*	
2	Barry, *Rogers' No. 43*	l.	r.	b.	g.	T. M.	M.	Hyb.						**
3	Brighton	l.	r.	d. p.	v. g.	T.	E.	Hyb.				†	*	*
4	Catawba	l.	m. r. o.	r.	b.	T. M. W.	L.	Lab.						
5	Champion	l.	r.	b.	.....	M.	E.	Lab.	*			†		
	Tallman's Seedling.													
6	Clinton	s.	m. r.	b.	g.	T. W.	L.	Rip.	*				*	
7	Concord	l.	l. r.	b.	g.	T. M. W.	M.	Lab.	*		*	**	*	**
8	Cottage	l.	r.	b.	g.	T. M.	E.	Lab.					*	*
9	Creveling	m.	m. r. o.	b	v. g.	T.	E.	Lab.			*	*	*	*
10	Cynthiana	s.	r.	b.	v. g.	W.	M.	Æst.						
11	Delaware	s.	s. r.	r.	b.	T. M. W.	M.	? x.	*		**	**	**	**
12	Diana	m.	s. r. o.	r.	v. g.	T. M.	L.	Lab.	*		*		*	*
13	Dracut Amber	l.	r.	r.	g.	M.	V. E	Lab.						
14	Duchess	m.	m. r.	w.	v. g.	T.	M.	Hyb.						†
15	Early Victor	m.	m. r.	b.	v. g.	T. M.	V. E	Lab						
16	Elsinburg	s.	m. r.	b.	v. g.	T.	E.	Æst.						
17	Elvira	s.	r.	w.	v. g.	W.	L.	Rip. x.						
18	Essex, *Rogers' No. 41*	l.	r.	b.	g.	T. M.	M.	Hyb.						
19	Eumelan	m.	r.	b.	v. g.	T.	M.	Lab.			†	†	*	
20	Goethe, *Rogers' No. 1*	l.	l. r. o.	g.	v. g.	T. W.	L.	Hyb.						
21	Hartford	l.	m. r. o.	b.	g.	M.	E.	Lab.	*		*	**	**	*
	Hartford Prolific.													
22	Herbemont	s.	m. r.	b.	v. g.	T. W.	L.	Æst.						
	Warren, &c.													
23	Herbert, *Rogers' No. 44*	l.	l. r.	b.	v. g.	T. M.	M.	Hyb.						*
24	Iona	m.	m. r. o.	r.	b.	T. M. W.	L.	Lab.		†				
25	Isabella	l.	m. r. o.	b.	g.	T. M.	L.	Lab.	*				*	
26	Ives	m.	m. r. o.	b.	g.	M. W.	M.	Lab.				**		
27	Janesville	m.	r.	b.	g.	T. M.	V. E	Lab.						
28	Jefferson	m.	m. r.	r.	v. g.	T. M.	M.	Hyb.						
29	Lady	l.	r.	w.	g.	T. M	E.	Lab.				†	*	
30	Lady Washington	l.	l. r. o.	w.	b.	T. M.	M.	Hyb						
31	Lindley, *Rogers' No. 9*	m.	m. r. o.	r.	g.	T. M.	M.	Hyb.			*		*	*
32	Massasoit, *Rogers' No. 3*	l.	m. r.	r.	g.	T. M.	M.	Hyb.						*
33	Martha	l.	s. r	g.	g.	M. W.	M.	Lab.				*		*
34	Maxatawney	m.	m. r. o.	g.	v. g.	T.	M.	Lab.						
35	Merrimac, *Rogers' No. 19*	l.	s. r.	b.	g.	M.	M.	Hyb.			**	*		*
36	Moore's Early	l.	r.	b.	g.	T. M.	V. E	Lab.				†	*	**
37	Niagara	l.	r.	w.	g.	T. M.	M.	Lab.						
38	Noah	s.	r.	w.	g.	W.	L.	Rip. x.						
39	Norton's Virginia	s.	m. r.	b.	g.	W.	L.	Æst.						†
40	Perkins	l.	r.	r.	g.	T. M.	E.	Lab.					*	
41	Peter Wylie	m.	r.	w.	v. g.	T.	...	Hyb.						
42	Pocklington	l.	l. r.	w.	g.	T. M.	M.	Lab.					†	
43	Prentiss	m.	m. r.	w.	v. g.	T. M.	M.	Lab.					†	
44	Rebecca	m.	s. r.	g.	v. g.	T.	M.	Lab.			*	*		*
45	Salem, *Rogers' No. 52*	l.	r.	b.	g.	M.	M.	Hyb.	*		**	*	*	
46	Scuppernong	l.	r.	r.	g.	W.	M.	Vulp.						
47	Telegraph	l.	m. r. o.	b.	v. g.	T. M.	E.	Lab.			*	*	*	
	Christine.													
48	Triumph	v. l.	l. r.	g.	v. g.	T.	L.	Hyb.						
49	Vergennes	s.	l. r.	p.	v. g.	T. M.	E.	Lab.					†	
50	Walter	m.	s. r.	r.	b.	T. M. W.	M.	Lab.			†			
51	Wilder, *Roger's No. 4*	l.	l. r.	b.	v. g.	T. M.	M.	Hyb.			**	*		**
52	Worden	l.	r.	b.	g.	T. M.	E.	Lab.				*	*	**

3 A hybrid variety of great excellence.
4 Suited only to clayey loams and certain localities.
10, 17, and 38 are wine grapes of great promise in Missouri.
5 Valued for earliness and hardiness but of a very poor quality.
6 Hardy everywhere.
25 Valueless at the West.
26 Valued for dark wine.
7 Successful over a wider range of soil and climate than any other variety.
9 Bunches loose.
36 Resembles Concord; a little earlier.
44 The more known the better liked.

VIII.—GRAPES, NATIVE.

ORIGIN.—This list contains such grapes only as are of American origin; they are either cultivated varieties of one of the following American species of native wild grapes: Vitis Riparia, Vitis Æstivalis, Vitis Labrusca, Vitis Vulpina, or crosses between varieties of these species, or hybrids between these and the Vitis Vinifera (foreign grapes). And as it is believed that the species native to any locality are best adapted to produce satisfactory results in that locality, it has been thought useful to designate in the column for origin the species to which each variety belongs, as follows: Lab., Labrusca, native of New England; extends to South Carolina and into the Allegbany mountains Æst., Æstivalis, native of the Middle and Southern States, on uplands. Rip., Riparia, native of Lower Canada; extends west to Nebraska, south to Texas; prefers river banks. Vulp., Vulpina, native of the Southern States, not further north than Maryland Tennessee and Arkansas. x after one of the species denotes a cross with a variety of some other species. Hyb., Hybrid, between a foreign variety and one of the native species.

Between 42° and 49°. | II.—CENTRAL DIVISION.—Between 35° and 42°. | III. -S. DIV.—Bet. 28° & 35°.

NUMBER.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
1	*		*	*	*	**								*			*			*		**	**		*																	*		
2	*		*	*	*										*					*																								
3	*	**	*	*	*	*								*	**	*	*	*	**	*	*				*		*								**							*		
4			*		*											*	*			*	*		*	**	*		*	*	*		*			*		*								
5			*	*		*										**			*																							*		
6			*	*	*									*	*		*	*		*	*	*	*		*	*		*	*					*	*	*				*	*			
7	*	**	**	*	**	**	**						**	**	**		**	**	**	**	*	**	**	**	**	**	*	**	**	**				**	**	**	**	**		*	*	**		
8																									*																			
9	*			*	*	*							**		*		*					*						*						*		*	**		*					
10																				**					*		**												*			**		
11	*		**	*	**	**	**						*	*	*	*	**	**	*	**	*	**	**	**	*	**	*	**	*	*	*			*	**	*	**		*	*		**		
12	*		*		*								*	*		*				*	*		*	*			*	*							**	*	**			*				
13																													*															
14		*	*																																							†		
15	†	†																											†													*		
16			*											*	*	*	*			*				*																				
17																											**		*													*		
18				*	*																																							
19	†				*	*																	†	*				†																
20					*										*		*	*	*			**	*		*		*	*	*						**				*			**		
21	**	**	*	*	*	*								*		*	*	*	*			*	**	**		**		*	*	*	*			**	**					*	*	*		
22														*			*						*		*		*			*				*	*	*	**			*		**		
23	†	*	*	*																*																								
24	*		*		*	*							*	*				*							*			*			*			*	*							*		
25	*		*		*								**	*		*					*		*	**	*			*										*						
26		*	*		*	*								*	*	*	*	**	*	*	*		**	**	**	**	*	*	*	*	*			**	**	**	*		**	*	*	*		
27						*	*																																					
28	†	†																		†																						†		
29	*		*													*	*	†	*	*						*	*								*							**		
30	†																†		†	†															*							†		
31	*	*	*	*	*	*								**			*	*	*	*		**						†	*						*							**		
32	*			*	*	**								**			*			*		*			*		*															*		
33	†	*	*		†									*				*	*	*			*	*	*		*	*	*	**	†			†			**					**		
34														*	†	*	*			*		*	†	**				†	†		†			**	*					*	*			
35			*	*	*	*								*	*	*	*			*			**					†														*		
36	†		*	*	*	**								*	**	†		†	*							*	*			**				*	*							**		
37			*																																									
38			*																	†							**								*							*		
39			*		*											*	*	**	*	*	*	**	**		*	*	**	*	*		*			*	*	*			*			**		
40					*																		*				*							*	*							**		
41					*																													*	*									
42	*		*											*					*	†									†	†												†		
43	†																		*	†									†	†												*		
44	*		*		*									*			*					**																						
45	*		*	*	*	*								**				*	*	*		**		*				*		**					*									
46																		*	**					**										**	**	**	**		**	**	**			
47			*		*	†								*	*	†	†	†		*	†				†	*	*	†	†		†													
48																											*								*							**		
49	†	†	*											†																														
50	†				*	†								†			†	†				†	†					†	†	†	†			**								†		
51	*	*	*	*	*	**								*	**		*		*	*		**	*		*			†		**						*								
52	†	**	*	*	*	**	*							**	**	*	*	**	*	**						†	*		*	**				*	*									

11 Wants rich soil and high culture.
22 Makes the finest of white wine.
24 Unreliable except in a few locations.
29 Valuable for earliness and hardiness.
31 One of the most valuable of this class.
52 Very like Concord, but a trifle earlier and some think better.

IX.—GRAPES, FOREIGN.

As the Foreign Grapes are for cultivation under glass, they are not subject to those variations induced by climate or soil, and therefore they may be regarded as equally adapted to all localities. Very few of the local committees have made any report in reference to these Grapes. The list below contains such as have been already adopted by the Society, with a few others very generally esteemed. In California, Utah and sections of the Southern States, they require no artificial protection or heat: it has, therefore, been thought unnecessary to tabulate the States and Territories relative to them; but, taking the old catalogue, and simply adding to it a column relative to variety as adapted to a *cold house*, or its want of fire heat, in our Northern States, the old form is continued.

The columns explain: 1st- The COLOR of the fruit; 2d -FLAVOR; 3d—SEASON of maturity; 4th—Cold for a variety that does well without fire heat--Hot, for a variety wanting fire heat. In flavor, the only distinction is between those that are simply sweet, as the Chasselas or Hamburgs, and those having a distinct musky aroma, as the Muscats.

No.	NAMES.	COLOR.	FLAVOR.	SEASON.	VINERY.
1	Barbarossa	Black.	Sweet.	Very Late.	Hot.
	Prince Albert, Brizola.				
2	Black Champion	Black.	Sweet.	Early.	Cold.
3	Black Damascus	Black.	Sweet.	Late.	Cold.
4	Black Frontignan	Black.	Muscat.	Late.	Cold.
5	Black Hamburg	Black.	Sweet.	Medium.	Cold.
6	Black Prince	Black.	Sweet.	Medium.	Cold.
7	Black July	Black.	Sweet.	Early.	Cold.
8	Bowood Muscat	White.	Muscat.	Medium.	Hot.
9	Buckland Sweetwater	White.	Sweet.	Medium.	Cold.
10	Calabrian, *Calabrian Raisin*	White.	Sweet.	Late.	Hot.
	Raisin de Calabre.				
11	Canon Hall Muscat	White.	Muscat.	Late.	Hot.
12	Chasselas Musque, or Joslin's St. Albans	White.	Muscat.	Early.	Hot.
	Muscat blanc hative (?).				
13	Duke of Magenta	Black.	Sweet.	Early.	Hot.
14	Golden Hamburg	White.	Sweet.	Late.	Hot.
	Stockwood G. Hamburg.				
15	Golden Champion	Amber.	Sweet.	Medium.	Hot.
16	Grizzly Frontignan	Red & Yellow.	Muscat.	Medium.	Hot.
	Red Frontignan, Red Constantia				
17	Gros Colman	Purple.	Sweet.	Late.	Cold.
18	Lady Downes, *Lady Downes' Seedling*	Black.	Sweet.	Very Late.	Hot.
19	Muscat of Alexandria	White.	Muscat.	Late.	Hot.
20	Muscat Hamburg	Black.	Muscat.	Medium.	Hot.
21	Mrs. Pince's Muscat, *Mrs. Pince's Black Muscat*	Black.	Muscat.	Late.	Hot.
22	Queen of Nice	White.			
23	Red Chasselas	Red.	Sweet.	Medium.	Hot.
	Rose Chasselas.				
24	Red Lombardy	Red.	Sweet.	Medium.	Hot.
25	Rio Virgin				
26	Royal Muscadine	White.	Sweet.	Early.	Cold.
27	Silver Frontignan, *Early Silver Frontignan*	White.	Muscat.	Early.	Hot.
28	White Nice	White.	Sweet.	Late.	Hot.
29	West St. Peter's	Black.	Sweet.	Very Late.	Hot.
30	Wilmot's Hamburg	Black.	Sweet.	Medium.	Hot.
	Dutch Hamburg, Wilmot's Black Hamburg.				
31	White Sweetwater	White.	Sweet.	Early.	Cold.
	Dutch Sweetwater, etc.				
32	White Frontignan	White.	Muscat.	Medium.	Hot.
	White Constantia, Muscat blanc.				
33	Zinfindal	Black.	Sweet.	Medium.	Hot.

XI.—NECTARINES.

Explanation same as for Apricots.

NUMBER.	NAMES.	DESCRIPTION.							I.—N. DIV.—					
		SIZE.	FORM.	COLOR.	QUALITY.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Boston	l.	r. o.	o. r.	v. g.	F.	M.	Am.	..	..	..	..	..	..
2	Downton	l.	r. o.	o. r.	v. g.	F.	E.	F.	..	..	..	..	..	..
3	Early Newington	l.	r. o.	o. r.	v. g.	F.	E.	Am.	..	..	..	..	..	..
4	Early Violet	l.	r.	o. r.	b.	F.	E.	F.	..	..	..	..	..	..
5	Elruge	m	r. o.	o. r.	v. g.	F.	L.	F.	..	..	..	..	..	..
6	Stanwick	l.	r. o.	o. r.	g.	F.	L.	F.	..	..	..	..	..	..

X.—MULBERRIES—FIGS—POMEGRANATES.

The following list of mulberries, figs, and pomegranates was prepared by MR. P. J. BERCKMANS, of Georgia. In California and many sections of the Southern States, the figs and pomegranates are grown as readily as the apple in the Middle States.

No.	NAMES.	SEASON.	COLOR.	QUALITY.	SIZE.
	MULBERRIES.				
1	Hick's Everbearing	Early and Late.	Black.	Second.	
2	Downing	Early.	Black.	First.	
3	Persian Black	Late.	Black.	First.	
4	Johnson	Medium.	Black.	First.	
	FIGS.				
1	Alicante	Medium.	Brown.	First.	Medium.
2	Angelique	Early.	Yellow.	Second.	Small.
	Jaune Hative.				
3	Brunswick	Early.	Violet.	First.	Very Large.
	Madonna, Constantinople.				
4	Blue Genoa	Early.	Blue.	First.	Medium.
5	Black Ischia	Medium.	Black.	First.	Medium.
6	Brown Smyrna	Medium.	Brown.	First.	Medium.
7	Celestial	Early.	Pale Violet.	First.	Small.
8	Green Ischia	Early.	Green.	First.	Medium.
	White Ischia. Green Italian.				
9	Jaune Hative (see Angelique)				
10	Lemon	Early.	Yellow.	First.	Medium.
11	Violet, long	Medium.	Violet.	First.	Large.
12	Violet, round	Medium.	Violet.	Second.	Medium.
13	Nerii	Late.	White.	First.	Small.
14	Pregussata	Medium.	Purple.	First.	Small.
15	White Marseilles	Medium.	White.	Second.	Medium.
16	White Genoa	Medium.	White.	Second.	Large.
17	Superfine de la Sausaye	Late.	Brown.	First.	Medium.
18	Turkey	Early to Late.	Brown.	First.	Large.
	Brown Turkey.				
	POMEGRANATES.				
1	Sweet	Early.	Reddish.	First.	Large.
2	Acid	Early.	Deep Red.	Third.	Very Large.
3	Violet	Late.	Violet.	First.	Very Large.
4	Dwarf	Late.	Red.	Second.	Small.

MULBERRIES—No. 1 bears three months. No. 2 Best. No. 3 Very tart.

XI.—NECTARINES.

Explanation same as for Apricots.

	Between 42° and 49°.													II.—CENTRAL DIVISION.—Between 35° and 42°.														III—S. DIV.—28° and 35°.												
NUMBER.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Md. and D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
1		*		*													*																							
2		*		*																																				
3		*		*																				**																
4		*		*															*		*																			
5		*		*										*							*						*		*											
6		*		*													*		*										*											

XII.—ORANGES AND LEMONS.

THE FOLLOWING LIST WAS PREPARED BY MR. E. H. HART, OF FLORIDA.

The columns explain: SIZE—l, large; m., medium; s., small. FORM—ov., oval; r., round; fl., flattened; obl., oblong; QUALITY—f., fair; g., good; v. g., very good; b., best. SEASON—e., early; m., medium; l., late. ORIGIN—F., foreign; N., native.

NUMBER.	NAMES.	DESCRIPTION.					I.—N. DIV.—Bet. 42° and 49°.	II.—CENT. DIV.—Bet. 35° & 42°.	III.—SOUTH DIV.—Bet. 28° and 35°.										
		SIZE.	FORM.	QUALITY.	SEASON.	ORIGIN.			California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
1	Acapulo	l.	r.	g.	M.	F.			*				*			*	*			
2	Acis	l.	r.	g. g.	L.	F.			*				*			*	*			
3	Bell	l.	o. v.	g. g.	M.	F.			*				*			*	*			
4	Botelha	m.	r.	g.	M.	F.			*				*			*	*			
5	Brown					F.			*				*			*	*			
6	Buttercourt					F.			*				*			*	*			
7	Charley Brown	l.	fl.	g.	M.	F.			*				*			*	*			
8	Cleopatra								*				*			*	*			
9	Dancy's Tangierine	s.	fl.	g.	L.	N.			*				*			*	*			
10	Dulcissima	s.	r.	v. g.	E.	F.			*				*			*	*			
11	Du Roi	m.	r.	g.	M.	F.			*				*			*	*			
12	Egg	m.	o. v.	g.	E.	F.			*				*			*	*			
13	Excelsior	m.	r.	v. g.	L.	F.			*				*			*	*			
14	Exquisite	m.	r.	v. g.	M.	F.			*				*			*	*			
15	Grape Fruit (pmmelos)												*			*	*			
16	Hart's Late, or Tardive	m.	o. v.	v. g.	L.	F.			*				*			*	*			
17	Hamosassa	m.	r.	b.	M	N.			*				*			*	*			
18	Jaffa	m.	r.	v. g.	M.	F.			*				*			*	*			
19	Kumquat (for preserving)		obl. r.			N							*			*	*			
20	Long					F.			*				*			*	*			
21	Magnum Bonum	l.	r.	b.	M.	N.			*				*			*	*			
22	Majorca	m.	r.	v. g.	M.	F.			*				*			*	*			
23	Maltese Blood	s.	o. v.	v. g.	M.	F.			*				*			*	*			
24	Maltese Oval	l.	obl.	v. g.	L.	F.			*				*			*	*			
25	Mediterranean Sweet	l.	o. v.	v. g.	L	F.			*				*			*	*			
26	Nonpareil	l	r.	b.	E.	N.			*				*			*	*			
27	Old Vini	m.	r.	v. g.	M.	N.			*				*			*	*			
28	Paper Rind					F.														
	St. Michael.																			
29	Prata	s.	r	g.	M.	F.			*				*			*	*			
30	Queen					F.			*				*			*	*			
31	St. Michaels	m.	r.	g.	M.	F.			*				*			*	*			
32	St. Michaels	s.	fl.	g.	E.	F.			*				*			*	*			
33	St. Michael's Egg	l.	o. v.	f.	E.	F.			*				*			*	*			
34	Satsuma	m.	fl.	v. g.	E.	F.			*				*			*	*			
35	Shaddock Blood												*			*	*			
36	Shaddock Orange												*			*	*			
37	Sustain	l.	r.	g.	M.	F.			*				*			*	*			
38	Sweet Seville	s.	o. v.	v. g.	E.	F.			*				*			*	*			
39	Tahiti	l.	r.	g.	M.	F.			*				*			*	*			
40	White	l.		g.		F.			*				*			*	*			
	LEMONS.																			
41	Bijou					F.							*			*	*			
42	Eureka					F.							*			*	*			
43	Everbearing					F.							*			*	*			
44	French's Seedling					N.							*			*	*			
45	Genoa					F.							*			*	*			
46	Imperial					F.							*			*	*			
47	Lamb					N.							*			*	*			
48	Sicily					F.							*			*	*			
49	Villa Francha					F.							*			*	*			
50	Willow Leaved					F.							*			*	*			

The following are native varieties of the orange resembling each other, of good quality, and having a local reputation: Arcadia, Beaches 3, Dixon, Dummitt, Higgins, Osceola, Parson Brown, Peerless, Spratt's Harmon. Nos. 8, 9, 32 and 34 are varieties of Citrus Nobilis or Mandarin orange.

XII CONTINUED.—LIMES AND CITRONS.

THE FOLLOWING LIST WAS PREPARED BY MR. E. H. HART, OF FLORIDA.

NUMBER.	NAMES.	DESCRIPTION.					I.—N. Div.—Bet 42° and 49°.	II.—Cent. Div.—Bet. 35° & 42°	III.—South Div.—Bet. 28° and 35°										
		SIZE.	FORM.	QUALITY.	SEASON.	ORIGIN.			California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
	LIMES.																			
51	Dulcis												*			*	*			
52	Mexican												*			*	*			
53	Persian												*			*	*			
	CITRONS.																			
54	Medica (Lemon or Citron of commerce)												*			*	*			
55	Tuberosa (Orange Citron)												*			*	*			

XIII.—PEACHES.

The columns explain: Size—l, large; m., medium; s., small. Class—F., freestone; C., clingstone. Color—relative to the flesh, w., white or pale color; y., yellow or yellowish; g., greenish white, red at stone. Quality—j. v., juicy, vinous; m. j. r., melting, juicy, rich; s. j., sweet, juicy; s. j. h., sweet, juicy and high flavored. Glands—s., serrated, without glands; g., glands, globose; r., glands, reniform. Season—the season of maturity, as Early, Medium or Late; those designated as Early, ripen in lat. 43 deg. previous to or about Sept. 1st; Medium, those ripening from 1st to 15th of September; and Late those after that period; a few of the Very Early and Very Late are so designated—E., early; M., medium; L., late; V. E., very early; V. L., very late. Origin—Am., American; F., Foreign.

Number.	Names.	Description.							I.—N. Div.—					
		Size.	Class.	Color.	Quality.	Glands.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Albert, *Early Albert*	m.	F.	w.	m. j. r.	r.	E.	F.						
2	Allen's October						L.	Am.						
3	Alexander	m.	F.	w.	s. j.	g.	V. E.	Am.						*
4	Alexandra Noblesse	l.	F.	w.	m. j. v.	g.	M.	F.						
5	Amelia	l.	F.	w.	m. j. r.	r.	E.	Am.						
6	Amsden, *Amsden's June*	m.	F.	w.	s. j.	g.	V. E.	Am.						
7	Ashby's Early													
8	Austin's Late	l.	C.	w.	j. v.	r.	L.	Am.						
	Austin's Late Red.													
9	Baldwin's Late	l.	F.	w.	j. m.	r.	L.	Am.						
10	Barnard	m.	F.	y.	j. v.	g.	E.							
11	Beatrice, *Early Beatrice*	s.	F.	w.	m. j.	r.	V. E.	F.						
12	Beer's Smock	l.	F.	y.	j. v.		L.	Am.						
13	Bellegarde	l.	F.	g.	s. j.	g.	M.	F.						
14	Bergen's Yellow	m.	F.	y.	j. v.	r.	M.	Am.						*
15	Bordeaux	l.	C.	y.	j.	r.	E.	Am.						
16	Briggs' May	m.	F.	w.	m.		V. E.	Am.						
17	Catharine	l.	C.	y. g.	j. r.	r.	M.	Am.						
18	Chinese Cling	l.	C.	g.	j. v.	r.	M.							
19	Cole's Early, *Cole's Early Red*	m.	F.	w.	m. j. r.	g.	V. E.	Am.						
20	Columbia	l.	F.	y.	j. v.	r.	M.	Am.						
21	Conner's Cling													
22	Coolidge's Favorite	l.	F.	w.	s. j. h.	g.	M.	Am.						**
23	Cook's Late	m.	F.	w.	m. j. v.		L.	Am.						
	Cook's Late White.													
24	Counts	l.	C.	w.	m. j.		M.	Am.						
25	Crawford's Early	l.	F.	y.	j. v.	g.	M.	Am.						**
26	Crawford's Late	l.	F.	y.	j. v.	g.	L.	Am.						*
27	Crockett's Late	m.	F.	w.	s.	r.	L.	Am.						
	Crockett's Late White.													
28	Deming's Orange	l.	C.	y.	j. r.		L.	Am.						
	Deming's Sept.													
29	Druid Hill	l.	F.	g.	m. j. r.	g.	V. L.	Am.						
30	Duff Yellow	l.	C.	y.	m. j.	g.	E.	Am.						
31	Early Admirable	l.	F.	w.	m. j.	g.	M.	F.						
32	Early Grosse Mignonne	m.	F.	w.	m. j. v.	g.	E.	F.						
33	Early Newington Free	l.	F.	g.	j. v.	g.	E.	Am.						
34	Early York	m.	F.	w.	m. j. r.	s.	V. E.	Am						*
35	Eaton's Golden	m.	C.	y.	s. j.	r.	L.	Am.						
36	Flewellen	l.	C.	y.	j. r.		E.	Am.						
37	Foster	l.	F.	y.	j. v.	g.	L.	Am.						*
38	George the Fourth	m.	F.	y.	m. j. r.	g.	M.	Am.						*
39	Grosse Mignonne	l.	F.	w.	s. j. h.	g.	M.	F.						*
	Royal Kensington.													
40	Haine's Early	m.	F.	g.	s. j.	g.	V. E.	Am.						
41	Hale's Early	m.	F.	w.	m. j. r.	g.	V. E.	Am.						*
42	Harker, *Harker's Seedling*	l.	F.	y.	s. j.	g.	M.	Am.						
43	Heath Cling	l.	C.	g.	s. j. h.	r.	V. L.	Am.						
44	Hill's Chili	m.	F.	y.			L.	Am.						
45	Honeywell	m.	F.	w.	s. j		E.	Am.						
46	Hoover's Heath													
	Hoover's Late Heath.													
47	Hyslop Cling	l.	C.	w.	m. j. r.	r.	V. L.	Am.						
48	Indian Blood Cling	l.	C.	y.	j. v.	r.	L.	Am.						
49	Indian Blood Freestone	l.	F.					Am.						
50	Incomparable	l.	C.	w.	m. j.	r.	L.	Am.						
51	Jacques	l.	F.	y.	j. v.	r.	M.	Am.						*

XIII.—PEACHES.

The columns explain: SIZE—l, large; m., medium; s., small. CLASS—F., freestone; C., clingstone. COLOR—relative to the flesh, w., white or pale color; y., yellow or yellowish; g, greenish white, red at stone. QUALITY—j. v., juicy, vinous; m. j. r., melting, juicy, rich: s. j., sweet, juicy: s. j. h., sweet, juicy and high flavored. GLANDS—s., serrated, without glands; g., glands, globose; r., glands, reniform. SEASON—the season of maturity, as Early, Medium or Late: those designated as Early, ripen in lat. 43 deg. previous to or about Sept. 1st; Medium, those ripening from 1st to 15th of September: and Late those after that period: a few of the Very Early and Very Late are so designated—E., early; M., medium; L., late; V. E, very early: V. L., very late. ORIGIN—Am., American: F., Foreign.

	Between 42° and 49°.												II.—CENTRAL DIVISION.—Between 35° and 42°.																III.—S. DIV.—Bet. 28° & 35°						
NUMBER.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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2																																											
3	†		**		*									*					*	*			**	*		**	*	**				**		**				**	**		**		
4			*																														*				**					
5																			*	*				**									**	**	**				**	*	*		
6	†		*		*												*				*			*			**	*	**										**	*			
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26	*	**	**	*	*										**	*	**	**	**	*	**	**		*	**	*		*	**				*	**	*					*	*	*		
27																							*																					
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29			*		*									*	*	*	*		*	*	*		*	*	*		*															**		
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35																				*				**				**							**	**	**				**	*	*		
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38	*		*	*	*									*	*	*	*	*	*		*	*	**	**	*			*	*	*				**	*	*					**	*			
39	*		*	*	*									*	*		**	**	*	*	*	*		**	*			*		*	*	*		**	**	**	**				*	*	*	*	
40			*		*									*						*	*					*		*																
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42																							**																					
43					*									*	*	*	*	*	*	**	*	**	**	**	**	**		**	*	*				**	*	**			**	**	**	**	**	
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5 This originated in South Carolina and differs from the Missouri Amelia.

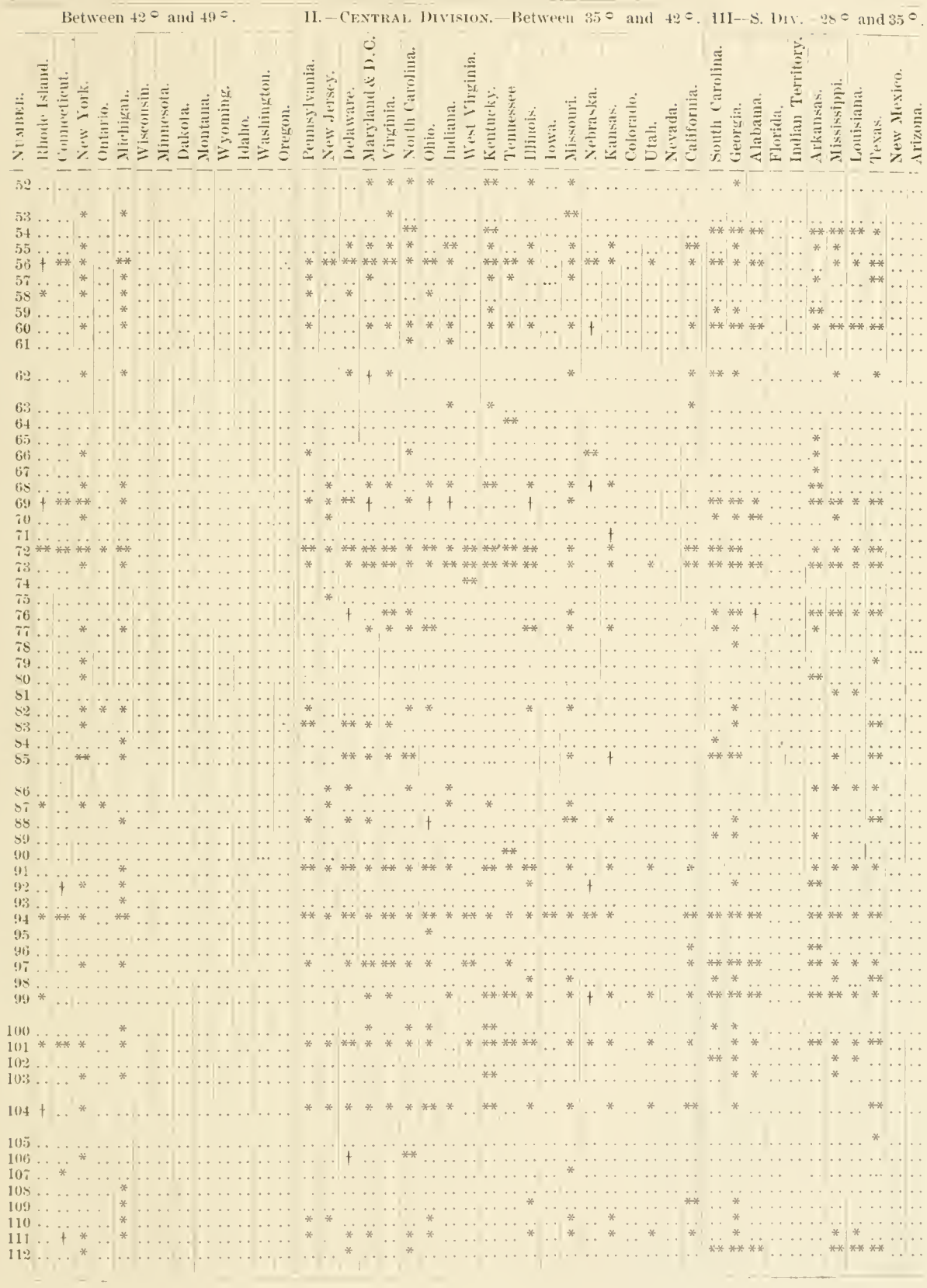
18 Berckmans thinks it is the same as Shanghae.

28 Resembles Lemon Cling.

Number.	NAMES.	DESCRIPTION.							I.—N. Div.—					
		Size.	Class.	Color.	Quality.	Glands.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
52	Kenrick's Heath	l.	F.	g.	j. v.	r.	L.	Am.						
	Heath Freestone.													
53	Keyport White	l.	F.	w. r.	m. j.	r.	V. L.	Am.						
54	Lady Parham	m.	F.	g.	j. v.	r.	V. L.	Am.						
55	La Grange	l.	F.	w.	s. j. h.	r.	V. L.	Am.						
56	Large Early York	m.	F.	w.	s. j. h.	g.	V. E.	Am.						
57	Large White Cling	l.	C.	w.	s. j.	g.	L.	Am						
58	Late Red Rareripe	l.	F.	w.	s. j. h.	g.	M.	Am.						
59	Late Admirable	v. l.	F.	y. g.	m. h.	g.	M.	F.						
60	Lemon Cling	l.	C.	y.	j. v.	r.	L.	Am.						
61	Leopold I.	l.	F.	y.	j. v.	r.	M.	F.						
	Leopold Freestone.													
62	Louise	m.	F.	w.	m. j.	r.	E.	Eng.						
	Early Louise.													
63	Malta	l.	F.	g.	m. j. r.	s.	M.	F.						
64	Mammoth Freestone	v. l.	F.											
65	Mitchell's Mammoth	l.	C.	g. w.	m. j.		L.	Am.						
66	Molden's White	l.	F.	w.	s. j.	r.	L.	Am.						
67	Montgomery's Late	l.	F.	w. r.	m. j.	r.	L.	Am.						
68	Morris' White	m.	F.	w.	m. j. r.	r.	M.	Am.						*
69	Mountain Rose	m.	F.	w.	s. j.	g.	M.	Am.						†
70	Noblesse	l.	F.	w.	s. j.	s.	M.	F						
71	Nugent's June	m.	C.	y. r.			V. E.	Am.						
72	Oldmixon Free	l.	F.	g.	s. j. h.	g.	M.	Am.						**
73	Oldmixon Cling	l.	C.	w.	m. j. r.	g.	M.	Am.						*
74	Pavie de Pompone	l.	C.	w.	m. j.	r.	L.	F.						
75	Petite Imperial	l.	F.	w.	m. j. v.	r.	L.	Am.						
76	Picquett's Late	l.	F.	y.	s. j.	r.	M.	Am.						
77	President	l.	F.	w.	m. j. r.	g.	M.	Am.						*
78	Prince of Wales	l.	F.	w.	m. j.	r.	M.	F.						
79	Princess of Wales	l.	F.	w.	m. j. v.	g.	M.	F.						
80	Pucel le de Malines	l.	F.	w. r.	m. j.	s.	M.	Am.						
81	Raymond Cling	l.	C.											
82	Red Cheek Melocoton	l.	F.	y.	j. v.	g.	M.	Am.						*
83	Reeves' Favorite	l.	F.	y. r.	m. j.	g.	M.	Am.						
84	Richmond	m.	F.	w.	m. j.	r.	M.	Am						
85	Rivers	l.	F.	p. y.	m. r.	r.	E.	Eng.						
	Early Rivers.													
86	Rodman's Cling	l.	C.	w.	j. v.	r.	L.	Am.						
87	Royal George	m.	F.	w.	m. j. r.	s.	E.	F.						
88	Salway	l.	F.	y. r.	m. j.	r.	M.	Am.						
89	Scott's October	m.	C.	y.			V. L.							
90	Shockley's Early													
91	Smock	l.	F.	y.	j. v.	r.	L.	Am						
92	Snow	m.	F.	w.	s. j.	r.	M.	Am.						
93	Snow's Orange	m.	F.	y.	m. j.	r.	M.	Am.						
94	Stump the World	l.	F.	w.	s. j. h.	g.	L.	Am.						
95	Sturtevant	m.	F.	y.	s. j. h.	g.	M.	Am.						
96	Strawberry	m.	F.	w.	m. h.	r.	M.	Am.						
97	Susquehanna	l.	F.	y.	s. j. v.	g.	M.	Am						
98	Thurber	l.	F.	w.	m. j. r.		E.	Am.						
99	Tillotson	l.	F.	g.	m. j. r.	s.	V. E.	Am.						
	Early Tillotson.													
100	Tippecanoe	l.	C.	y.	j. v.	r.	L.	Am.						
101	Troth's Early	m.	F.	w.	s. j.	g.	E.	Am.						
102	Tuskena Cling, *Lemon*													
103	Van Zandt	m.	F.	w.	m. j. r.	g.	M.	Am.						
	Van Zandt's Superb.													
104	Ward's Late	l.	F.	w.	r. j. s.	r.	L.	Am.						
	Ward's Late Free.													
105	Washington Cling	m.	C.	y. r.	m. j.	r.	L.	Am.						
106	Waterloo	l-m.	F.	w.	s. j.	g.	V. E.	Am.						
107	Wheatland	l.	F.	y.	s. j. h.	r.	M.	Am.						
108	Wheeler's Early	s.	F.	w. r.	m. j.		V. E.	Am.						
109	White Imperial	m.	F.	w.	m. j. r.	g.	E.	Am.						
110	Yellow Alberge	m.	F.	y.	s. j.	g.	E.	F.						*
111	Yellow Rareripe	l.	F.	y.	j. v.	g.	E.	Am.						*
112	Yellow St. John	l.	F.	y.	s. j.	g.	V. E.	Am.						
	Fleitu's, Flater's St. John.													

65 Resembles Heath Cling, but later.

106 One of the earliest.


Between 42° and 49°.
II.—Central Division.—Between 35° and 42°.
III.—S. Div.—28° and 35°.
Number.
Rhode Island.
Connecticut.
New York.
Ontario.
Michigan.
Wisconsin.
Minnesota.
Dakota.
Montana.
Wyoming.
Idaho.
Washington.
Oregon.
Pennsylvania.
New Jersey.
Delaware.
Maryland & D. C.
Virginia.
North Carolina.
Ohio.
Indiana.
West Virginia.
Kentucky.
Tennessee
Illinois.
Iowa.
Missouri.
Nebraska.
Kansas.
Colorado.
Utah.
Nevada.
California.
South Carolina.
Georgia.
Alabama.
Florida.
Indian Territory.
Arkansas.
Mississippi.
Louisiana.
Texas.
New Mexico.
Arizona.

XIV.—PEARS.

The columns explain as follows: Size—s., small; l., large; m.. medium. Form—p. pyriform; r. o. p., roundish obtuse pyriform; r. a. p., roundish acute pyriform; ob. p., obtuse pyriform; ob. o. p., oblong obtuse pyriform; r., roundish; r. ob., roundish obtuse. Color—y. g., yellow or yellowish green with a red or russet red cheek; y. r., yellow and russet; y., when mostly yellow or yellowish. Quality- g. good; v. g., very good; b., best. Use—F., valuable family dessert; K. M., kitchen and market; F. M., family and market. Season—S., summer; L. S., late summer; A., autumn; E. A., early autumn; L. A., late autumn; W., winter. Origin—Eng., English; Am., American; F., French; Fl., Flemish; B., Belgium; H. Holland.

Number.	Names.	DESCRIPTION. Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	I.—N. Div.— Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Abbott	m.	ob. p.	y. r.	v. g.	F.	E. A.	Am.	.	.	.	†	.	*
2	Amanlis	l.	r. o. p.	y. g.	g.	M.	E. A.	B.	.	.	.	.	*	.
	Beurre d'Amanlis.													
3	Ananas d'Ete	l.	p.	y. g.	v. g.	F. M.	E. A.	H.	.	.	.	.	*	.
4	Andrews	l.	p.	y. g.	v. g.	F.	E. A.	Am.	†	.	.	†	.	*
5	Angouleme	l.	o. b. o. p.	y.	v. g.	F. M.	A.	F.	*	.	**	*	.	**
	Duchesse d'Angouleme.													
6	Anjou	l.	ob. p.	y g.	v. g.	F. M.	L. A.	F.	*	.	**	**	**	**
	Beurre d'Anjou.													
7	Ansault	m.	ob. p.	y. r.	b.	F.	L. S.	F.	.	.	.	.	.	.
	Bonne du Puits Ansault.													
8	Bachman							Am.	.	.	.	.	.	.
	Dr. Bachman (local.)													
9	Bartlett	l.	o. b. o. p.	y.	v. g.	F. M.	L. S.	Eng.	**	.	*	*	*	**
10	Baronne de Mello	m.	r. a. p.	y. r.	v. g.	F. M.	E. A.	B.	.	.	.	.	.	*
11	Belle Lucrative	m.	r. o. p.	y. g.	b.	F.	E. A.	Fl.	.	.	**	*	*	*
	Fondante d'Automne.													
12	Bergen	l.	p y. r.	y. g.	g.	F. M.	E. A.	Am.	.	.	.	.	.	.
13	Beurre Goubault	m.	ob. r.	g. y.	g.	F.	L. S.	F.	.	.	.	.	.	.
14	Beurre Precoce	m.	ob. p.	y. r.	g.	F. M.	S.	F.	.	.	.	.	.	.
15	Bilboa	m.	p.	y.	v. g.	F.	E. A.	.	*	.	.	.	.	*
	Golden Beurre of Bilboa.													
16	Bloodgood	m.	r.	y. r.	v. g.	F.	S.	Am.	.	.	*	*	*	*
17	Bordeaux	m.	r.	y. r.	g.	M.	W.	F.	.	.	.	.	.	†
	Duchesse de Bordeaux.													
18	Bosc	l.	p.	y. r.	b.	F. M.	L. A.	B.	*	.	*	*	*	**
	Beurre Bosc.													
19	Boussock	l.	r. o. p.	y. r.	v. g.	F. M.	E. A.	B.	†	.	.	*	.	**
	Doyenne Boussock.													
20	Brandywine	m.	r. ob.	y. g.	v. g.	F. M.	S.	Am.	*	.	.	*	.	**
21	Brialmont	l.	ob. p	y. r.	v. g.	F. M.	A.	B.	.	.	.	.	.	*
22	Brignais	m.	r. ob.	y.	v. g.	F.	E. A.	.	.	.	.	.	.	*
	Beurre de Brignais, Des Nonnes.													
23	British Queen	l.	ob. p.	y. r.	v. g.	F. M.	A	Eng.	.	.	.	.	.	.
24	Buffum	m.	r. o. p.	y. g.	g.	M.	E. A.	Am.	.	.	*	**	*	*
25	Caen de France	m.	ob. p.	y. r.	v. g.	F. M.	W.	F.	.	.	.	.	.	*
26	Catillac	l.	r. a. p.	y.	g.	K. M	W.	F.	.	.	.	.	.	*
27	Chambers	m.	ob. p.	y.	g.	F. M.	S.	Am.	.	.	.	.	.	.
28	Clairgeau	l.	p.	y. r.	g.	M.	L. A.	F.	*	.	*	.	*	*
	Beurre Clairgeau.													
29	Clapp's Favorite	l.	o. b. o. p.	y. g.	v. g.	F. M.	S.	Am.	*	.	**	*	*	**
30	Columbia	l.	r. o. p.	y.	g.	M. K.	W.	Am.	.	.	.	.	.	*
31	Comice	l.	r. o. p.	y. g.	b.	F. M.	L. A.	F.	.	.	.	.	.	**
	Doyenne du Comice.													
32	Dallas	l.	ob. p.	y. g.	v. g.	F. M.	L. A.	Am.	.	.	.	.	.	*
33	Dana's Hovey	s.	r. ob. p.	y. g.	b.	F.	W.	Am.	.	.	.	.	*	**
34	Dearborn	s.	r. p.	y.	v. g.	F.	S.	Am.	.	.	*	*	.	*
	Dearborn's Seedling.													
35	Diel	l.	r. ob. p.	y. r.	v. g.	F. M.	L. A.	B.	*	.	*	.	*	.
	Beurre Diel.													
36	Dix	l.	ob. p.	y.	b.	F. M.	L. A.	Am.	.	.	.	.	.	.
37	Doyenne d'Alencon	m.	r. p.	y. r.	v. g.	F. M.	W.	.	.	.	.	.	.	*
38	Duchess Precoce	l.	p. y. r.	y. g.	g.	F. M.	E. A.	F.	.	.	.	.	.	.
39	Easter Beurre	l.	r. ob. p.	y. r.	v. g.	F.	W.	B.	.	.	.	.	*	.

11 Not profitable for market.

XIV.—PEARS.

The columns explain as follows: SIZE—s., small; l., large; m., medium. FORM—p. pyriform; r. o. p., roundish obtuse pyriform; r. a. p., roundish acute pyriform; ob. p., obtuse pyriform; ob. o. p., oblong obtuse pyriform; r., roundish; r. ob., roundish obtuse. COLOR—y. g., yellow or yellowish green with a red or russet red cheek; y. r., yellow and russet; y., when mostly yellow or yellowish. QUALITY—g. good; v. g., very good; b., best. USE—F., valuable family dessert; K. M., kitchen and market; F. M., family and market. SEASON—S., summer; L. S., late summer; A., autumn; E. A., early autumn; L. A., late autumn; W., winter. ORIGIN—Eng., English; Am., American; F., French; Fl., Flemish; B., Belgium; H. Holland.

Between 42° and 49°. II.—CENTRAL DIVISION.—Between 35° and 42°. III.—S. DIV.—Bet. 28° & 35°

NUMBER.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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39	..	*	*	..	*	..	..	..	..	..	..	..	**	..	*	..	**	*	..	*	*	*	**	*	*	*	*	*	*	..	..	..	**	*	*	..	..	..	*	..	..	*	..	..

39 Requires very high cultivation.

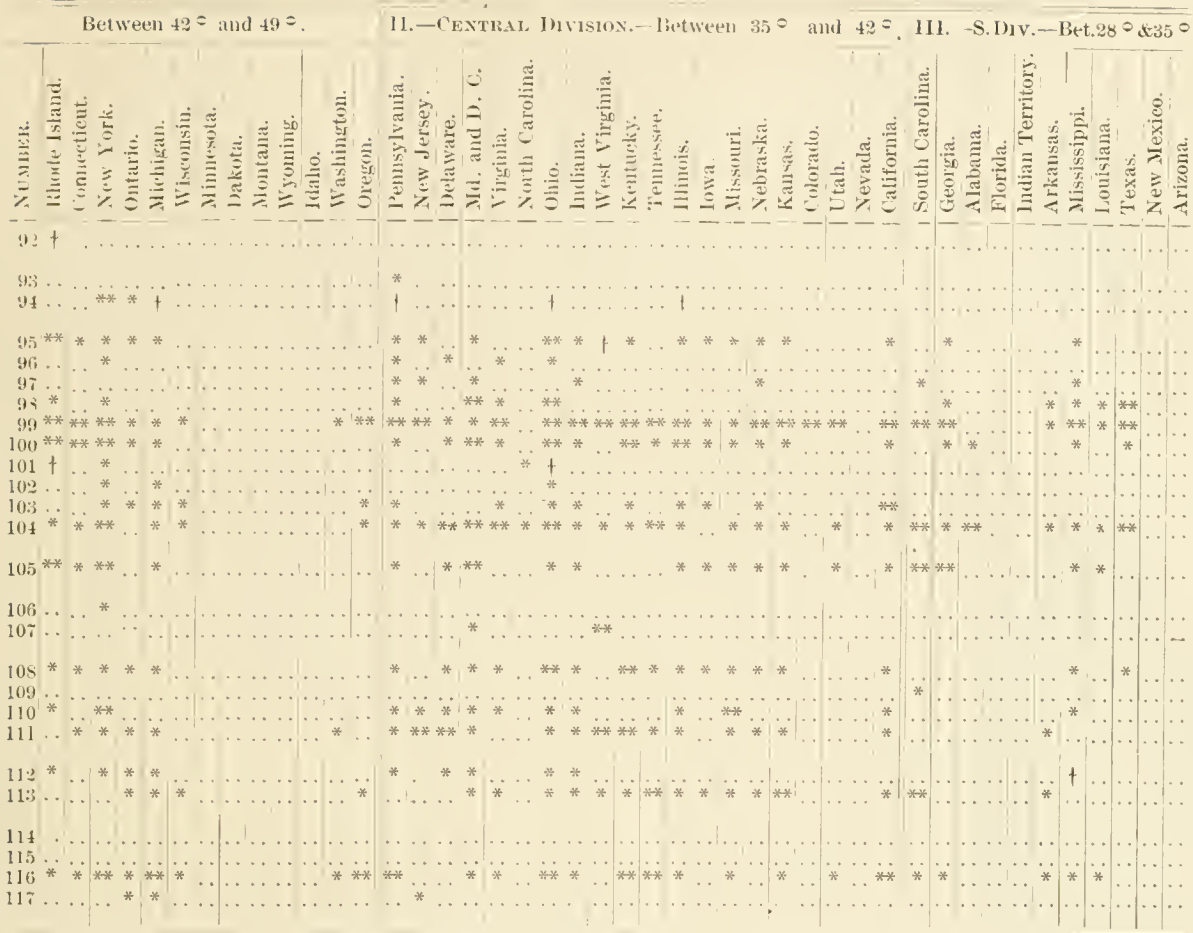
Number.	Names.	Description.							I.—N. Div.—					
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
40	Eastern Belle	m.	ob. p.	y. r.	v. g.	F.	E. A.	Am.			*			
41	Emile d'Heyst	l.	ob. p.	y. r.	b.	F.	L. A.	B.						*
42	Epine Dumas	m.	r. o. p.	y.	v. g.	F.	L. A.							*
	Bell Epine Dumas, Duc de Bordeau.													
43	Flemish Beauty	l.	r. ob. p.	y. g.	v. g.	F. M.	E. A.	B.				*	**	
44	Fontenay	m.	r. a. p.	y. r.	v. g.	F. M.	A.	F.						
	Jalousie de Fontenay Vendee.													
45	Foster's Seekel	s.	ob. p.	y. r.	b.	F. M.	E. A.	Am.						*
46	Frederick Clapp	m.	r. ob. p.	y.	b.	F. M.	E. A.	Am.						*
47	Fulton	s.	r. ob.	y. r.	v. g.	F.	A.	Am.			*	*		*
48	Giffard	m.	p.	y. g.	v. g.	F. M.	S.	F.			*	*	*	*
	Beurre Giffard.													
49	Glout Morceau	l.	ob. p.	y.	g.		L. A.						*	*
50	Goodale	l.	ob. p.	y. g.	v. g.	F. M.	A.	Am.			*	†		*
51	Gray Doyenne	m.	r.	y. r.	b.	F. M.	L. A.	F.						
52	Hardy	l.	ob. p.	y. g.	v. g.	F. M.	E. A.		**		*	*		*
	Beurre Hardy.													
53	Harris	m.	o. b. o. p.	y. r.	v. g.	F.	E. A.	Am.						*
54	Helen Gregoire	m.	r. o. p.	y. g.	v. g.	F.	E. A.	F.						
55	Henkel	l.	r. ob. p.	y. r.	v. g.	F.	E. A.	B.						*
56	Hosenschenk	m.	r. ob.	y.	g.	M.	S.	Am.						*
	Moore's Pound.													
57	Howell	l.	r. p.	y. g.	v. g.	F. M.	E. A.	Am.	*		*	**		**
58	Jaminette	m.	r. ob.	y. r.	g.	F. M	W.							
59	John Williams	m.			v. g.		W.	Am.						
60	Jonah	l.			g.	F. M.	W.	Am						
	Winter Jonah.													
61	Josephine of Malines	m.	r. ob. p.	y. r.	v. g.	F. M.	W.	F.				†		*
62	Julienne	s.	r. ob.	y.	g.	F. M.	S.							
63	Kieffer	l.	r. o. p.	y. r.	g.	K. M	A	Am.						
64	Kingsessing	l.	ob. p	y.	g.	F. M.	E. A.	Am.						*
65	Kirtland	m.	r. ob.	y. r.	v. g.	F. M.	E. A.	Am.	†		†	*		
66	Knight	m.	r. ob.	y.	g.	M.	A.	Am.						*
	Knight's Seedling.													
67	Langelier	m.	ob. p.	y. r.	v. g.	F. M.	W.	F.						*
	Beurre Langelier.													
68	Lawrence	m.	r. o. p.	y. r.	v. g.	F. M.	W.	Am			*	**		**
69	Le Conte	l.	ob. p.	y.	g.	M.	S.	Am.						
70	Lindley	m.	r. ob.	y. g.	v. g.	F.	E. A.	F.						*
	Dr. Lindley.													
71	Louise Bonne of Jersey	l.	ob. p.	y. g.	v. g.	F. M.	E. A.	F.	*		*	**	**	*
72	Madeleine	m	p.	y. g.	v. g.	F. M.	S.	F.					*	
73	Madame Andre Leroy	l.	o. b. o. p.	y. r.	v. g.	F.	E. A.	F.						
74	Madame Eliza	l.	r. a. p.	y. r.	v. g.	F. M.	A.	B.						*
75	Madame Treyve	m.	r. o. p.	y. r.	v. g.	F.	L. S.	F.						
76	Manning's Elizabeth	s.	ob. p.	y. r.	v. g.	F.	S.				*	*		*
77	Marie Louise	l.	p.	y. r.	v. g.	F.	A.	B.						*
78	Margaret	m.	ob. p.	y g.	b.	F.	S.	F.						
	Petite Marguerite.													
79	McLaughlin	l.	ob. p.	y. g.	v. g.	F. M.	W.	Am.				*		*
80	Merriam	m.	r. ob.	y. r.	g.	F. M.	A.	Am.				**		**
81	Mount Vernon	m.	r. o. p.	y. r.	v. g.	F. M.	L. A.	Am.						*
82	Napoleon	l.	ob. p.	y.	g.	M.	A.	B.						
83	Onondaga	l.	ob. p.	y. g.	v. g.	F. M.	L. A.	Am.	*			*	*	*
	Swan's Orange.													
84	Osband's Summer	s.	r. p.	y. g.	v. g.	F.	S.	Am					*	*
85	Ott	s.	r.	y. g.	g.	F.	S.	Am.						
86	Paradise of Autumn	l.	r. a. p.	y. r.	v. g.	F.	E. A.	B.	*			**	*	**
	Paradis d'Automne.													
87	Passe Colmar	l.	r. o. p.	y.	g.	M.	W.	B.						*
88	Pinneo or Boston	s.	r. ob.	y. g.	g.		S.	Am.						*
89	Poiteau	l.	p.	y.	g.	M.	L. A.	B.						
	Nouveau Poiteau.													
90	Pound	l.	p.	y.	g.	K. M.	W.							*
	Belle Angevine, Winter Bell, Uvedale's St. Germain.													
91	Pratt	m.	ob. p.	y. r.	g.	M.	E. A.	Am.					†	*

51 Fails in Eastern States.
58 An old variety; very healthy and productive.
59 Supposed to be Columbia.
61 The finest late winter melting pear, where it succeeds.
68 A hardy tree: valuable.
71 Very productive and profitable.

47 A hardy, productive tree.
49 Unreliable at the North.
72 Some say liable to blight.
77 A capital pear but unreliable.
78 Superior to Summer Doyenne.
80 Valuable for market.

Number.	NAMES.	DESCRIPTION. Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	I.—N. Div.— Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
92	Quimper	m.	r. p.	y. g.	v. g.	F.	S.	B.					*	*
	Supreme de Quimper.													
93	Reading	l.	ob. p.	y. r.	g.	F. M.	W.	Am.						
94	Reeder	s.	r. o. p	y. r.	b.	F.	L. A.	Am.						†
	Dr. Reeder.													
95	Rostiezer	s.	p.	y. g.	b.	F.	S.				*	**	*	**
96	Rutter	m.	r. ob.	y. g.	v. g	F. M	A.	Am.						
97	St. Ghislain	m.	p.	y.	g.	F. M.	E. A.	B.					*	*
98	St. Michael Archange	l.	r. p.	y. g.	g.	F. M.	A.	F.				*		**
99	Seckel	s.	r.	y. g.	b.	F. M.	A.	Am.	*			**	*	**
100	Sheldon	m.	r.	y. g.	v. g.	F. M.	A.	Am.			*	*	*	**
101	Souvenir du Congres	l.	p. y. r.	y. g.	v. g.	F. M.	S.	F.	*			†		*
102	Sterling	m.	r.	y. g.	v. g.	F. M.	E. A.	Am.						*
103	Stevens' Genesee	l.	r.	y.	v. g.	F. M.	E. A.	Am.	*					
104	Summer Doyenne	s.	r. o. p.	y. g.	v. g.	F.	S.	B.			*	**	*	*
	Doyenne d' Ete.													
105	Superfin	m.	r. p.	y. r.	v. g.	F.	A.	F.			*		*	**
	Beurre Superfin.													
106	Therese Appert	m.	ob. o. p.	y. r.	v. g.	F.	L. S.	F						
107	Triumph of Jodoigne	l.	ob. p.	y. g.	v. g.	F. M.	A.	B.						
	Triomphe de Jodoigne.													
108	Tyson	m.	r. a. p.	y. g.	b.	F.	S.	Am.				*	*	*
109	Upper Crust (local)	m.	r.	g. rus.	p o'r		S.	Am.						
110	Urbaniste	m.	p.	y. g.	v. g.	F. M.	A.	B.				*	*	*
111	Vicar	l.	p.	y.	g.	K. M.	W.	F.	*				*	**
	Vicar of Winkfield, Le Cure.													
112	Washington	m.	ob. o. p.	y.	v. g.	F. M.	E. A.	Am.						*
113	White Doyenne	m.	ob. p.	y. g.	b.	F. M.	A.	F.					*	
	Virgalieu.													
114	Wilbur	s.	r.	y. r.	g.	F.	E. A.	Am.						*
115	Willermoz	l.	ob. p.	y. r.	g.	M.	W.	B.						*
116	Winter Nelis	m.	ob. p.	y r.	b.	F. M.	W.	B.	*			*	*	*
117	Windsor	l.	p.	g.	g.	M.	S.							*
	Summer Bell.													

94 Delicious, but too small to meet the present market wants.
101 One of the largest and most beautiful melting pears.
108 A hardy tree.



113 One of the best, but variable in the Eastern and Middle States.
116 Of rare excellence; requires age ere profitable.
117 Of poor quality, but profitable for market in some places.

XV —PLUMS.

The columns explain: SIZE—l., large; m., medium: s., small. FORM—r., roundish; o., oval; r. o., roundish oval: o. ob., oval obovate. COLOR—p., purplish or very dark; r., reddish or copper color; y., yellow; g. y. greenish yellow; y. r., yellowish with shades or spots of red. QUALITY—g., good: v. g., very good; b., best. USE—F., family; M., market. SEASON—E., early; M., medium; L., late. ORIGIN—Am., American; F., foreign.

NUMBER.	NAMES.	DESCRIPTION.							I.—N. DIV.—					
		SIZE.	FORM.	COLOR.	QUALITY.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Admiral												*	
2	Bavay's Green Gage	l.	r.	g. y.	b.	F.	L.	F.	*		*	*	*	*
	Reine Claude de Bavay.													
3	Belgian Purple	l.	r. o.	g. y.	v. g.	F. M.	M.	F.						
4	Bleeker's Gage	m.	r. o.	y.	v. g.	F. M.	M.	Am.			*			
5	Blue Imperatrice	m.	o. ob.	p.	v. g.	F. M.	L.	F.						
6	Boddært	l.	r.	g. r.	v. g.	F. M.	M.	F.						
	Boddært's Green Gage.													
7	Bradshaw	l.	o. ob.	r. p.	g.	M.	M.	Am.?	*		*			*
8	Bryanstone Gage	m.	o.	y. r.	v. g.	F.	L.	F.						†
9	Canawa, *Peach Leaved*	m.	o.	r.	g.	F. M.	V. L.	Am						
10	Chickasaw	s.	r.	y. r.	g.	M.	L.	Am.						
11	Coe's Late Red	m.	r.	p.	v. g.	F. M.	L.	F.						
12	Coe's Golden Drop	l.	o.	y. r.	v. g.	F. M.	L.	F.	*		*		*	*
13	Columbia	l.	r.	p.	g.	M.	M.	Am.	*		*		*	
14	Copper	m.	o	p.	g.	F. M.	M.	F.						
15	Cruger's Scarlet	m.	r. o.	r.	g.	F.	M.	F.					*	
16	Damson	s.	o.	p	g.	M.	L.	Am.	*		*		*	
17	De Caradeuc	m.	r.	y. r.	g.	F. M.	E.	Am						
18	De Montfort	m.	r.	p.	v. g.	F. M	E.	F.						
19	De Soto	m.	r. o.	y. r.	v. g.	F. M.	M.	Am.						
20	Denniston, *Denniston's Superb*	l.	r.	g. y.	v. g.	F. M.	M.	Am.						
21	Domine Dull	m.	o.	p.	g.	M.	M.	Am.						
22	Drap d'Or	s.	r.	y.	g.	F.	E.	F.	*					
23	Duane's Purple	l.	o.	r. p.	g.	F. M.	E.	Am.	*				*	*
24	Early Favorite	m.	r. o.	p.	g.	F.	E.	F.					*	
25	Eldridge													
26	Elfry	s.	o.	p.	g.	F. M.	M.	Eng.						
27	Forest Garden	m.	r.	r.	v. g.	F. M.	E.	Am.						
28	German Prune	l.	o.	p.	g.	F. M.	M.	F.	*					
29	General Hand	l.	r. o.	g. y.	g.	F. M.	M.	Am.						
30	Green Gage	s.	r.	g. y.	b.	F.	M.	F.	**		*	**	*	*
31	Hudson Gage	m.	r.	g. y.	v. g.	F. M.	E.	Am.						
32	Huling's Superb	l.	r. o.	g. y.	g.	F. M.	M.	Am.			*		*	
33	Imperial Gage	l.	o.	g. y.	b.	F. M.	M.	Am.	*		*		*	*
34	Imperial Ottoman	m.	r.	y.	g.	F.	E.	F.					*	
35	Indian Chief													
36	Italian Prune, *Fellemberg*	m.	o.	p.	g.	F. M.	M.	F.					*	
37	Jefferson	l.	o.	y. r.	b.	F. M.	M.	Am.	*		*		*	*
38	July Green Gage	m.	r.	y. r.	v. g.	F.	E.	F.						
39	Kirke's	m.	r. o.	p.	g.	F.	M.	F.						
40	Lawrence's Favorite	l.	r.	g. y.	b.	F.	M.	Am.					*	
41	Lombard	m.	r. o.	r. p.	g.	M.	M.	Am.	*		*	*	**	*
42	Long Scarlet. *Scarlet Gage*	m.	r. ob.	r.	g.	F.	M.	F.					*	
43	McLaughlin	l.	r.	y. r.	b.	F. M.	M.	Am.	*		*		*	*
44	Miner	m	obl.	r.	g.	F. M.	M.	Am.						
45	Monroe	m.	o.	g. y.	g.	M.	M.	Am.						
46	Moore's Arctic	m.	r. o.	p.	g.	F. M.	M.	Am.	*	*	*	*	*	
47	Newman	m.	o.	r.	g.	F. M.	E.	Am.						
48	Nofa Bene (Corse)	l.	r.	r. g.	g.	F.	M.	Am.					*	
49	Orleans, *Red Damask*	m.	r.	r.	g.	F.	M.	F.						
50	Oullin's Golden, *Oullin's Golden Gage*	l.	r. o.	g. y.	v. g.	F. M.	M.	F.						
51	Peach	l.	r.	p.	g.	M.	E.	F.					*	*
52	Pond's Seedling, *Fonthill*	l.	o.	y. r.	g.	M.	M.	F.	*					*

XV —PLUMS.

The columns explain: Size—l., large; m., medium: s., small. Form—r., roundish; o., oval; r. o., roundish oval; o. ob., oval obovate. Color—p., purplish or very dark; r., reddish or copper color; y., yellow; g. y. greenish yellow; y. r., yellowish with shades or spots of red. Quality—g., good; v. g., very good; b., best. Use—F., family; M., market. Season—E., early; M., medium; L., late. Origin—Am., American; F., foreign.

	Between 42° and 49°.													II.—Central Division. Between 35° and 42°.																III.—S. Div.—28° and 35°.									
Number.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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Number.	Names.	Description.							I.—N. Div. —					
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
53	Prince Engelbert	l.	o.	p.	v. g.	F. M.	M.	F						†
54	Prince's Yellow Gage	m.	o.	y.	v. g.	F. M.	E.	Am.	*				*	*
55	Prune of Agen	m.	o.	p.	b.	F.	M.	F.						
56	Purple Gage	m.	r.	p.	v. g.	F. M.	M.					*		
57	Purple Favorite	m.	r. ob.	p.	b.	F. M.	E.	Am.						
58	Reagles' Gage	m.	r.	g. y.	v. g.	F. M.	M.	Am.						
59	Richland	m.	o.	p.	g.	F. M.	M.	Am.						
60	Quackenboss	l.	r.	p.	g.	M.	M.	Am.	*					
61	Royale Hative	m.	r.	p.	v. g	F. M.	E.	F.					*	
62	Royale de Tours	l.	r.	r.	g.	M.	E.	F.						
63	Schenectady Catherine	m.	r. o.	r.	g.	F.	M.	Am.					*	
64	Shropshire Damson	s.	o.	p.	g.	F. M.	L.	Eng.						
65	Smith's Orleans	l.	o.	r. p.	v. g.	F. M.	M.	Am.	**		*		*	*
66	St. Catherine	m.	ob.	g. y.	v. g.	M.	L.	F.						
67	St. Martin, *St. Martin's Quetsche*	m.	o.	g. y.	g.	M.	L.	F.				*		
68	Sharp's Emperor, *Victoria*	l.	r. o.	y. r.	g.	M.	M.	F.	*					*
69	Temple													
70	Transparent, *Transparent Gage*	m.	r. ob.	g. y.	v. g.	F.	M.	F.						
71	Wangenheim	m.	o.	p.	g.	M.	M.	F.						
72	Washington	l.	r o.	g. y.	v. g.	F. M.	M.	Am.	*		*	**	*	*
73	Weaver	m.	flat.	r.	v. g.	F. M.	M.	Am.						
74	Wild Goose	s.	o.	y. r.	g.	M.	M.	Am.						
75	Yellow Egg, *White Magnum Bonum*	l.	o.	y.	g.	F. M.	M.		**		*		*	

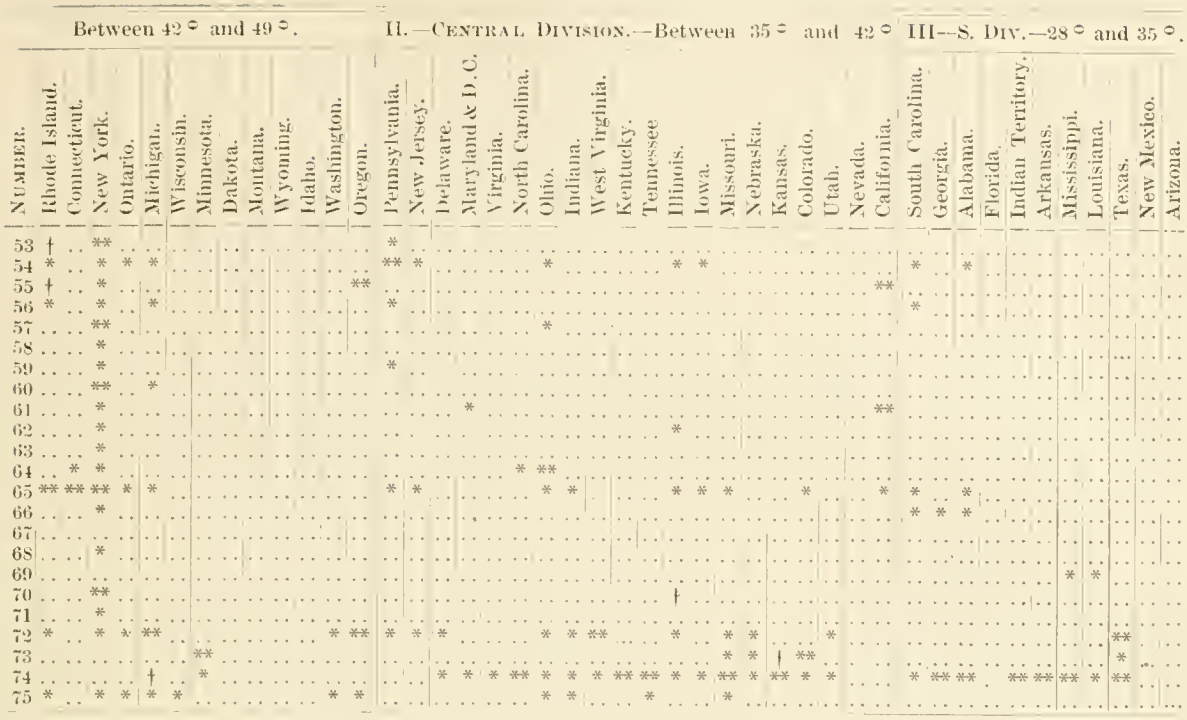
XVI.—QUINCES.

The columns explain: Size—l., large; m., medium; v. l., very large. Form—ob. p., oblate pyriform; r., roundish; r. ob. p., roundish obtuse pyriform. Color—y., yellowish or yellowish green. Quality—t., tender; h. t., half tender. Use—K., kitchen; M., market. Season—E., early; E. to L., early to late. Origin—Am., American; F., foreign.

Number.	Names.	Description.							I.—N. Div. —					
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Angers	v. l.	ob. p.	y.	t.	M. K.	E. to L.	F.	*		†			*
2	Apple or Orange	l.	r.	y.	h. t.	M. K.	E. to L.		*		*	*		*
3	Champion	v. l.	ob. p.	y.	g.	M. K.	L.	Am.						
4	Chinese	l.	ob.	y.	h. t.	K.	L.	F.						
5	Pear	vl.	p.	y.	g.	M. K.	L.	Am.	*					
6	Portugal	v. l.	ob. p.	y.	t.	M. K.	E.	F.						
7	Rea	l.	r. ob. p.	y.	h. t.	M. K.	E.	Am.						

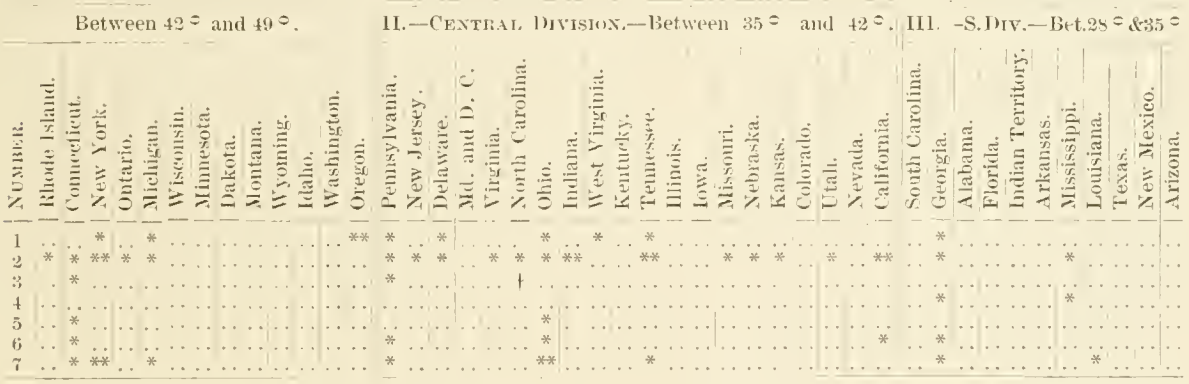
3 A new variety not extensively tested.

4 Large and valuable at the South, in strong soils.



XVI.—QUINCES.

The columns explain: Size—t., large; m., medium; v. l., very large. Form—ob. p., oblate pyriform; r., roundish; r. ob. p., roundish obtuse pyriform. Color—y., yellowish or yellowish green. Quality—t., tender; h. t., half tender. Use K., kitchen; M., market. Season—E., early; E. to L., early to late. Origin Am., American; F., foreign.



XVII.—RASPBERRIES.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—r., roundish; r. c., roundish conical; c., conical; ob. c., obtuse conical. COLOR—b., black; r., reddish; p. purplish; y., yellow. QUALITY—g., good; v. g., very good; b., best. USE—M., most profitable for market; F. M., of value for family and market; F., mostly valued for the family dessert. SEASON—E., early; L., late; M., medium. ORIGIN—Am., American; F., Foreign.

NUMBER.	NAMES.	DESCRIPTION.							I.—N. DIV.—					
		SIZE.	FORM.	COLOR.	QUALITY.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	American Black (c), *Doolittle*	s.	r.	b.	g.	M.	M.	Am.					*	
2	Brandywine, *Susquco*	m.	r. c.	r.	g.	F. M.	M.	Am.						
3	Caroline	l.	r. ob.	y.	g.	F. M.	M.	Am.						*
4	Clarke	m.	r.	r.	g.	F. M.	E.	Am.	*		**	*	*	*
5	Cuthbert	l.	r. ob. c.	r.	g.	F. M.	M.	Am.					*	*
	Queen of the Market.													
6	Fastolf	l.	r. c.	r.	v. g.	F.	M.	F.	*					
7	Fontenay, *Belle de Fontenay*	l.	c.	r.	g.	F.	L.	F.						
8	Four Seasons Red	l.	r. c.	r.	v. g.	F.	L.	F.						
	Merveille de Quatre Saisons, October Red.													
9	Franconia	l.	r. c.	p.	v. g.	F. M.	M.	F.	*					**
10	French	m.	r.	r.	v. g.	F.	M.	Am			*			
11	Gregg (c)	v. l.	r.	b.	g.	F. M.	M.	Am.					*	
12	Hansell	m.	r. ob.	r.	v. g.	F. M.	V. E.	Am.						
13	Herstine	l.	ob c.	r.	v. g.	F. M.	M.	Am.						*
14	Highland Hardy	m.	r. ob. c.	r.	g.	F. M.	E.	Am.						
15	Hornet	l.	c.	r.	v. g.	F. M.	M.	F.						*
16	Hudson River Antwerp	l.	c.	r.	b.	F. M.	M.	Am.	*				*	
17	Imperial Red	m.	r.	r.	b.	F. M.	M.	Am.						
18	Knevett	l.	ob. c.	r.	b.	F.	M.	F.			*		*	*
	Knevett's Giant.													
19	McCormick (c)	m.	ob. c.	b.	v. g.	F. M.	L.	Am.			**		*	*
	Mammoth Cluster.													
20	Marlboro	l.	r. c.	r.	g.	F. M.	M.	Am.						
21	Miama (c)	m.	r.	b.	g.	F. M	M.	Am.						
22	Montclair	l.	r.	p.	v. g.	F. M.	M.	Am.						
23	Ohio (c)	m.	r.	b.	g.	F. M.	M.	Am						
24	Ohio Everbearing (c)	m.	c.	b.	g.	F. M.	L.	Am.						
25	Orange	l.	c.	y.	b.	F.	M.	Am.	*		*		*	*
	Brinckle's.													
26	Palluau	l.	c.	r.	v. g.	F.	M.	F.						
	Belle de Palluau.													
27	Philadelphia	m.	r.	p.	g.	M.	M.	Am.			*			
28	Purple Cane (c)	m.	r.	p.	g.	M.	M.	Am.						
29	Reliance	l.	r. ob.	r.	g.	F. M.	M.	Am.						
30	Shaffer's Colossal (c)	v. l.	r.	p.	g.	F. M.	M.	Am.						
31	Smith's (c)	v. l.	r.	b.	g.	F. M.	M.	Am.						
32	Souchetti	l.	c.	y.	g.	F.	M.	F.						*
33	Souhegan (c)	m.	r.	b.	g.	F.		Am.				*		**
34	Superb	l.	r.	r.	v. g.	F. M.	M.	Am.						
35	Thwack	l.	r.	p. r.	g.	F. M.	M.	Am.						
36	Turner	m.	r.	r.	g.	F. M.	M.	Am.						
37	Tyler	m.	r.	b.	v. g.	F. M.	E.	Am.						

NOTE—Those designated thus (c) are varieties of Blackcap (*Rubus occidentalis.*)

7 Best of Autumnal bearing sorts.

25 Valued for family use.

XVII.—RASPBERRIES.

The columns explain: Size—l., large; m., medium; s., small. Form—r., roundish; r. c., roundish conical; c., conical: ob. c., obtuse conical. Color—b., black; r., reddish; p. purplish; y., yellow. Quality—g., good; v. g., very good; b., best. Use—M., most profitable for market; F. M., of value for family and market: F., mostly valued for the family dessert. Season—E., early; L., late; M., medium. Origin—Am., American; F., Foreign.

	Between 42° and 49°.													II.—Central Division.—Between 35° and 42°.																		III.—S. Div.—28° and 35°.								
Number.	Rhode Island.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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37						**																																						

XVIII.—STRAWBERRIES.

The columns explain: SIZE—l., large; s., small; m., medium. SEX—H., hermaphrodite; P., pistillate. COLOR—d. c., deep crimson; d. s., deep scarlet; b. s., bright scarlet; w. t., whitish tinted with red; l. c., light crimson. FORM—r. c., roundish conical; o. c., obtuse conical or coxcomb form; c., conical; r., roundish; r. o. c., roundish obtuse conical. FLESH—s., soft; f., firm; m., medium. SEASON—E., early; M., medium; L., late; E. L., early to late. ORIGIN—Am., American; F., Foreign.

NUMBER.	NAMES.	DESCRIPTION.							I.—N. DIV.—					
		SIZE.	SEX.	COLOR.	FORM.	FLESH.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Bidwell	v. l.	H.	b. s.	c.	f.	M.	Am.						
2	Black Defiance	l.	H.	d. r.	r. o. c.	f.	M.	Am.				*		
3	Captain Jack	l.	H.	d. r.	r. c.	f.	L.	Am.				*		
4	Champion	l.	P.	d. c.	r.	m.	L.	Am.	*			†		
	Windsor Chief.													
5	Charles Downing	l.	H.	d. s.	c.	f.	M.	Am.	*			*	*	**
6	Col. Cheney	l.	P.	b. s.	o. c	f.	M.	Am.	*		*			*
7	Crescent	l.	P.	b. s.	r. c.	m.	M.	Am.	*			*		*
8	Cumberland	v. l.	H.	b. s.	r. c.	s.	M.	Am.	*			†	**	*
	Cumberland Triumph.													
9	Downer's Prolific	m.-l	H.	b. s.	r. c.	s.	E.	Am.						
10	Duchess	l.	H.	b. r.	r. c.	f.	E.	Am.						
11	Duncan	m.	H.	b. r.	r. c.	s.	E.	Am.						
12	Finch	l.	H.	s.	r.	f.	M.	Am.						
13	Glendale	l.	P.	b. r.	c.	f.	L.	Am.	*			*		
14	Great American	l.	H.	d. r.	r. c.	f.	M.	Am.						
15	Gypsy	m.	P.	c.		f.	M.	Am.				†		
16	Hart's Minnesota	m.	H.	c.	r.	f.	E.	Am.						
17	Hervey Davis	l.	H.	b. s.	o. c.	f.	M.	Am.						**
18	Hovey	l.	P.	b. s.	r.	f.	M.	Am.	*		*		*	*
	Hovey's Seedling.													
19	James Vick	m.	H.	c.	r. c.	m.	M.	Am.						
20	Jersey Queen	v. l.	P.	b. s.	r. c.	f.	L.	Am.				†		
21	Jucunda	l	H.	b. s.	o. c.	f.	L.	F						
22	Kentucky	l.	H.	b. s.	r. c.	f.	L.	Am.				†		*
23	Manchester	l.	P.	s.	o. c	f.	M.	Am.				†		*
24	Miner's Prolific	v. l.	H.	c.	r. c.	m.	M.	Am.	*			*		*
	Miner's Great Prolific.													
25	Monarch	v. l.	H.	b. r.	r. o. c.	f.	M.	Am.						
	Monarch of the West.													
26	Mount Vernon	l.	H.	l. s	r. o. c.	m.	L.	Am.						
27	Neuman	l.		l. s.	c.	f.	M.	Am.						
	Neuman's Prolific, Charleston.													
28	Old Iron Clad	l.	H.	s.	o. c.	f.	M.	Am.				†		
	Phelp's Seedling.													
29	Pioneer	l.	H.	c.	r.	m.	M.	Am.						*
30	Piper's Seedling	l.	H.	c.	r. c.	f.	E.	Am.				†		
31	Primo	m.	H.	s.	c.	f.	L.	Am.				†		*
32	Russell's Advance	l.	H.	c.	r.	f.	L.	Am.						
33	Seneca Queen	l.	H.	d. c.	c.	m.	L.	Am.						
34	Seth Boyden	l.	H.	r.	o. c.	f.	M.	Am.	*					*
35	Sharpless	v. l.	H.	b. r.	o. c.	f.	M.	Am.				*	*	**
36	Shirts	v. l.	H.	b. c.	c.	f.	M.	Am.						
37	Triomphe de Gand	l.	H.	l. c.	o. c.	f.	M.	F.	*		*		*	*
38	Triple Crown	l.	H.	d. c.	c.	f.	M.	Am.						
39	Truitt's Surprise	l.	H.	d. r.	o. c.	f.	M.	Am.						
40	Wilder	l.	H	b. s.	r. o. c.	f.	M.	Am.				*		*
	President Wilder.													
41	Wilson	l.	H.	d. c.	r. c.	f.	E. L.	Am.	**		*	*	**	*
	Wilson's Albany.													

4 Valuable late sort. 14 Needs good soil and high cultivation. 18 An old and highly valued sort.
27 Chiefly grown for market at Charleston and other points South. Quality medium to poor.

XVIII.—STRAWBERRIES.

The columns explain: SIZE—l., large; s., small; m., medium. SEX—H., hermaphrodite; P., pistillate. COLOR—d. c., deep crimson; d. s., deep scarlet; b. s., bright scarlet; w. t., whitish tinted with red; l. c., light crimson. FORM—r. c., roundish conical; o. c., obtuse conical or coxcomb form; c., conical; r., roundish; r. o. c., roundish obtuse conical. FLESH—s., soft; f., firm; m., medium. SEASON—E., early; M., medium; L., late; E. L., early to late. ORIGIN—Am., American; F., Foreign.

35 Has made a first rate record over a large portion of the country.

41 Unrivaled as a market sort in most parts of the country. Quality poor.

CATALOGUE

OF

Native and Introduced Species of Fruits and Nuts,

IN THE UNITED STATES AND CANADA.

NOTE—The following Catalogue is intended to include all species of introduced *Fruits* and *Nuts* growing or cultivated in the open air in any part of the United States or the Dominion of Canada, that have proved to be or promise to be valuable to the grower.

The "starring" of this first table has necessarily been done with insufficient data, and any information that will help to perfect it or to make additions to the list itself will be thankfully received.

NUMBER.	NAMES.		ORIGIN.	I.—N. DIV.—					
	BOTANICAL.	COMMON		Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
1	Achras sapota	Sapodilla Plum							
2	Amelanchier Canadensis	Service	N.	*	*	*	*	*	*
3	Ananassa sativa	Pine Apple							
4	Anona Cherimolia	Cherimoyer							
5	Anona squamosa	Sweetsop							
6	Anona muricata	Soursop							
7	Asimina triloba	Pawpaw	N.						
8	Berberis vulgaris	Barberry		*					*
9	Cactus opuntia	Indian Fig							
10	Carica Papaya	West Indian Pawpaw							
11	Carya alba	Shell bark Hickory	N.	*					*
12	Carya olivæformis	Pecan	N.						
13	Carya sulcata	Large Shell bark Hickory	N.						
14	Castanea vesca	European Chestnut							
15	Castanea Americana	American Chestnut	N.	*		*	*	*	*
16	Castanea pumila	Chinquipin	N						
17	Citrus Aurantium	Orange							
18	Citrus Limonum	Lemon							
19	Citrus Limetta	Lime							
20	Citrus medica	Citron							
21	Cocus nucifera	Cocoa-nut							
22	Corylus Americana	American Hazel	N.	*					
23	Corylus Avellana	Filbert		*					
24	Corylus rostrata	Beaked Hazel-nut	N.				*	*	*
25	Cydonia vulgaris	Quince		*					
26	Cydonia Sinensis	Chinese Quince							
27	Diospyros Virginiana	Persimmon	N.						
28	Diospyros Kaki	Japanese Persimmon							
29	Diospyros Texana	Black Persimmon	N.						
30	Eriobotrya Japonica	Loquat							
31	Fagus ferruginea	Beech	N.	*	*	*	*	*	*
32	Ficus Carica	Fig							
33	Fragaria vesca	Alpine Strawberry	N.	*					
34	Fragaria Virginiana	American Strawberry	N.	*	*	*	*	*	*
35	Fragaria Chilensis	South American Strawberry	N.	*					
36	Gaylussacia resinosa	Black Huckleberry	N.	*					
37	Gaylussacia frondosa	Blue Dangleberry	N.						
38	Grias cauliflora	Anchovy Pear							
39	Juglans cinerea	Butternut	N.				*	*	*
40	Juglans nigra	Black Walnut	N.						
41	Juglans regia	European Walnut							
42	Laurus Persea	Avocado, or Alligator Pear							
43	Mespilus Germanica	Medlar		*					
44	Morus rubra	Red Mulberry	N.	*					*
45	Morus nigra	Black Mulberry							
46	Morus alba	White Mulberry							
47	Musa paradisiaca	Plaintain							

CATALOGUE

OF

Native and Introduced Species of Fruits and Nuts,

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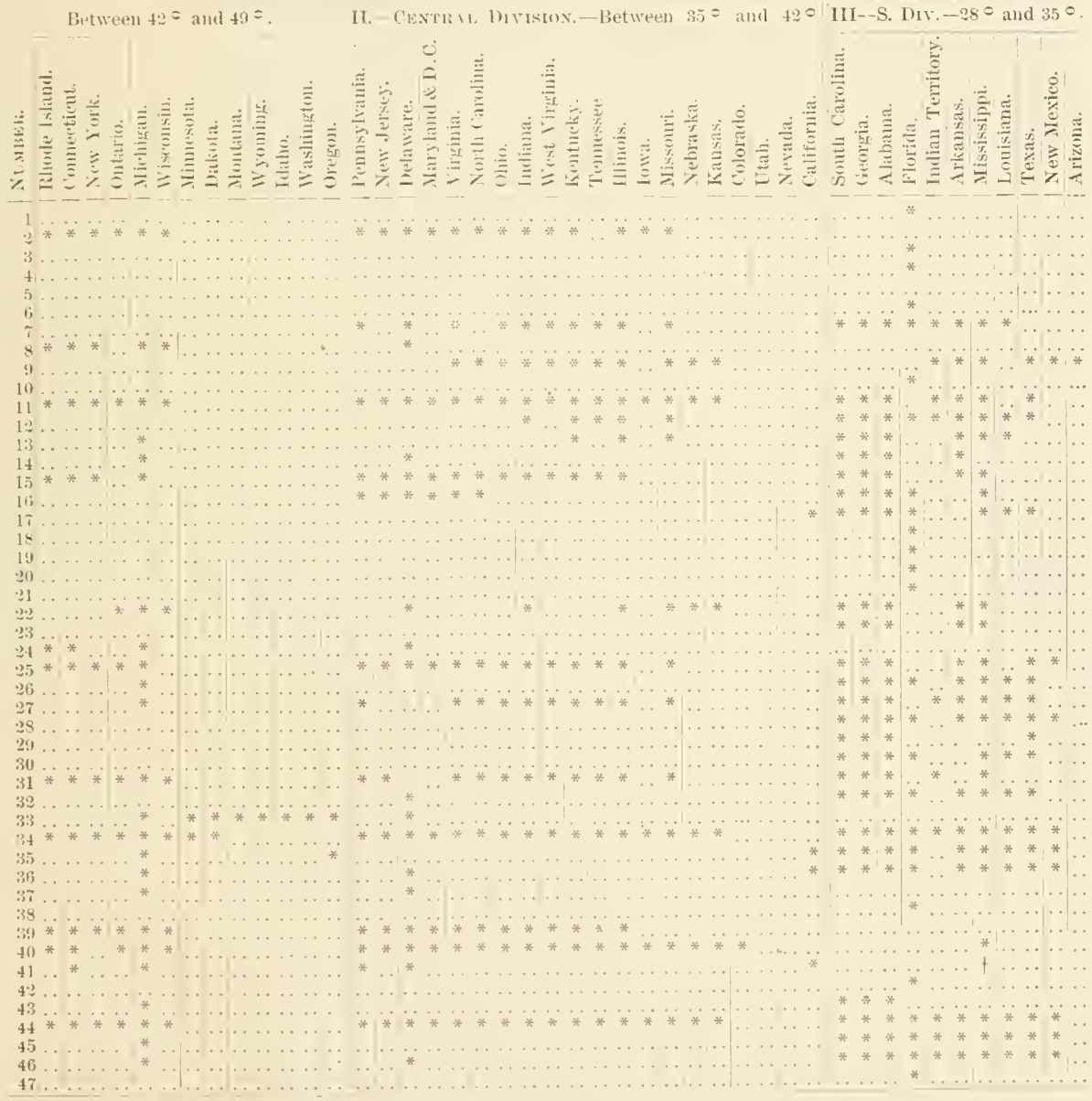
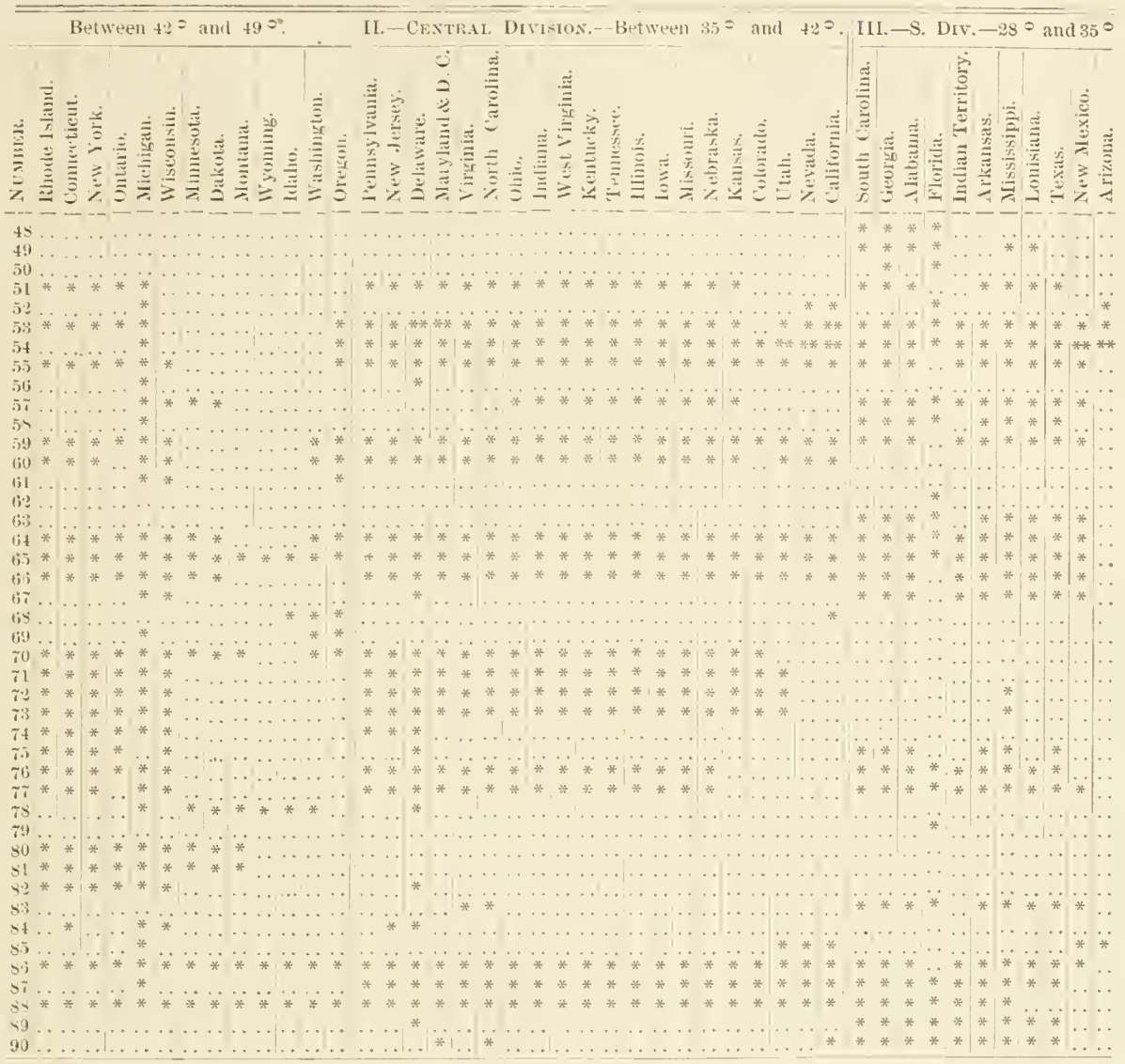
The "starring" of this first table has necessarily been done with insufficient data, and any information that will help to perfect it or to make additions to the list itself will be thankfully received.



Number.	NAMES.		Origin.	I.—N. Div.—					
	Botanical.	Common		Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.
48	Musa sapientum	Banana							
49	Olea Europea	Olive							
50	Phœnix dactylifera	Date Palm							
51	Podophyllum peltatum	May Apple	N.						*
52	Prunus (Amygdalus) communis	Almond							
53	Prunus (Amygdalus) Persica	Peach		*					*
54	Prunus Armeniaca	Apricot		*					
55	Prunus domestica	Garden Plum		*	*	*	*	*	*
56	Prunus maratima	Beach Plum	N.	*					
57	Prunus Americana	Wild red and yellow Plum	N.	*					
58	Prunus Chicasa	Chickasaw Plum	N.	*					
59	Prunus cerasus	Garden red Cherry (Morello, &c.)		*	*	*	*	*	*
60	Prunus avium	Bird Cherry (Heart, &c.)		*				*	*
61	Prunus pumila	Dwarf Cherry	N.	*					
62	Psidium pyriferum	Guava							
63	Punica Granatum	Pomegranate							
64	Pyrus communis	Pear		*		*	*	*	**
65	Pyrus Malus	Apple		*	*	*	*	*	*
66	Pyrus prunifolia	Siberian Crab		*	*	*	*	*	*
67	Pyrus coronaria	American Crab	N.	*					
68	Pyrus rivularis	Oregon Crab	N.						
69	Ribes Grossularia	English Gooseberry		*	*				
70	Ribes hirtellum	Houghton Gooseberry, &c.	N.			*	*	*	*
71	Ribes rubrum	Red Currant	N.	*	*	*	*	*	*
72	Ribes nigrum	Black Currant	N.	*	*	*	*	*	*
73	Rubus occidentalis	Black Cap Raspberry	N	*	*	*	*	*	*
74	Rubus Idæus	European Raspberry		*		*	*	*	*
75	Rubus strigosus	Wild Red Raspberry	N.	*	*	*	*	*	*
76	Rubus villosus	Blackberry	N.	*		*	*	*	*
77	Rubus canadensis	Dewberry	N.	*					*
78	Shepherdia argentea	Buffalo Berry	N.						
79	Tamarindus Indica	Tamarind							
80	Vaccinium Pennsylvanicum	Dwarf Early Blueberry	N.			*	*	*	*
81	Vaccinium canadense	Canada Blueberry	N.	*		*	*	*	*
82	Vaccinium corymbosum	Swamp Blueberry	N.	*		*	*	*	*
83	Vaccinium tenelum	Southern Blueberry	N.						
84	Vaccinium macrocarpa	American Cranberry	N.	*					
85	Vitis vinifera	European Grape							
86	Vitis Labrusca	Northern Fox Grape (Concord, &c.)	N.		*	*	*	*	*
87	Vitis æstivalis	Summer Grape (Herbemont, &c.)	N.						
88	Vitis cordifolia	Winter Grape (Clinton, &c.)	N.	*	*	*	*	*	*
89	Vitis vulpina	Bullace Grape (Muscadine, &c.)	N.						
90	Zizyphus sativus	Jujube							


Between 42° and 49°.
II.—Central Division.—Between 35° and 42°.
III.—S. Div.—28° and 35°
Number.
Rhode Island.
Connecticut.
New York.
Ontario.
Michigan.
Wisconsin.
Minnesota.
Dakota.
Montana.
Wyoming.
Idaho.
Washington.
Oregon.
Pennsylvania.
New Jersey.
Delaware.
Maryland & D. C.
Virginia.
North Carolina.
Ohio.
Indiana.
West Virginia.
Kentucky.
Tennessee.
Illinois.
Iowa.
Missouri.
Nebraska.
Kansas.
Colorado.
Utah.
Nevada.
California.
South Carolina.
Georgia.
Alabama.
Florida.
Indian Territory.
Arkansas.
Mississippi.
Louisiana.
Texas.
New Mexico.
Arizona.

CHANGES IN NOMENCLATURE

The following lists comprise all the names which have been changed in the Society's Catalogue:

APPLES.

NAME REJECTED.	NAME ADOPTED.
American Golden Pippin	American Golden.
American Summer Pearmain	American Summer.
Carolina Red June	Carolina June.
Chenango Strawberry	Chenango.
Cooper's Early White	Cooper's Early.
Cox's Orange Pippin	Cox's Orange.
Danver's Winter Sweet	Danver's Sweet.
Duchess of Oldenburg	Oldenburg.
Early Red Margaret	Early Margaret.
Hubbardston Nonsuch	Hubbardston.
Jewett's Fine Red	Jewett's Red.
Kentucky Red Streak	Kentucky Red.
King of Tompkins County	Tompkins King.
Kirkbridge White	Kirkbridge.
Large Yellow Bough	Sweet Bough.
Marquis of Lorne	Lorne.
Marston's Red Winter	Marston's Red.
Otoe Red Streak	Otoe.
Pleasant Valley Pippin	Pleasant Valley.
Pyle's Red Winter	Pyle's Winter.
Striped Sweet Pippin	Striped Sweet.
Tewksbury Winter Blush	Tewksbury Winter.
Twenty Ounce Apple	Twenty Ounce.

CHERRIES.

Bigarreau of Mezel	Mezel.
Early Purple Guigne	Early Purple.
Empress Eugenie	Eugenie.
Knight's Early Black	Knight's Early.

CURRANTS.

Fertile d' Angers	Angers.
Fertile de Palluau	Palluau.
Knight's Large Red	Knight's Red.
La Versaillaise	Versaillaise.

GOOSEBERRIES.

Smith's Improved	Smith's.
Woodward's Whitesmith	Whitesmith.

GRAPES.

Hartford Prolific	Hartford.

FOREIGN GRAPES.

Calabrian Raisin	Calabrian.
Early Silver Frontignan	Silver Frontignan.
Lady Downes' Seedling	Lady Downes.
Mrs. Pince's Black Muscat	Mrs. Pince's Muscat.
Wilmot's Black Hamburg	Wilmot's Hamburg.

PEACHES.

Amsden's June	Amsden.
Austin's Late Red	Austin's Late.
Cole's Early Red	Cole's Early.
Cook's Late White	Cook's Late.
Crackett's Late White	Crackett's Late.
Early Albert	Albert.
Early Beatrice	Beatriee.
Early Louise	Louise.
Early Rivers	Rivers.
Early Tillotson	Tillotson.

PEACHES.

NAME REJECTED.	NAME ADOPTED.
Harker's Seedling	Harker.
Hoover's Late Heath	Hoover's Heath.
Van Zandt's Superb	Van Zandt.
Ward's Late Free	Ward's Late.

PEARS.

Belle Epine Dumas	Epine Dumas.
Beurre Bosc	Bosc.
Beurre Clairgeau	Clairgeau.
Beurre d'Amanlis	Amanlis.
Beurre d'Anjou	Anjou.
Beurre de Brignais	Brignais.
Beurre Diel	Diel.
Beurre Giffard	Giffard.
Beurre Hardy	Hardy.
Beurre Langelier	Langelier.
Beurre Superfin	Superfin.
Bonne du Puits Ansault	Ansault.
Dearborn's Seedling	Dearborn.
Doyenne Boussoek	Boussoek.
Doyenne d' Ete	Summer Doyenne.
Doyenne du Comice	Comice.
Dr. Baehman	Baehman.
Dr. Lindley	Lindley.
Duchesse d'Angouleme	Angouleme.
Duchesse de Bordeaux	Bordeaux.
Golden Beurre of Billboa	Billboa.
Jalousie de Fontenay Vendee	Fontenay.
Josephine de Malines	Josephine of Malines.
Knight's Seedling	Knight.
Louise Bonne de Jersey	Louise Bonne of Jersey.
Nouveau Poiteau	Poiteau.
Paradis d'Automne	Paradise of Autumn.
Petite Marguerite	Margaret.
Supreme de Quimper	Quimper.
Triomphe de Jodoigne	Triumph of Jodoigne.
Vicar of Winkfield	Vicar.
Winter Jonah	Jonah.

PLUMS.

Boddært's Green Gage	Boddært.
Denniston's Superb	Denniston.
Oullin's Golden Gage	Oullin's Golden.
Transparent Gage	Transparent.

QUINCES.

Rea's Seedling	Rea.

RASPBERRIES.

Belle de Palluau	Palluau.
Belle de Fontenay	Fontenay.
Knevett's Giant	Knevett.
Merveille de Quartre Saisons	Four Seasons Red.

STRAWBERRIES.

Cumberland Triumph	Cumberland.
Hovey's Seedling	Hovey.
Miner's Great Prolific	Miner's Prolific.
Monarch of the West	Monarch.
Neunan's Prolific	Neunan.
President Wilder	Wilder.
Wilson's Albany	Wilson.

RULES FOR EXHIBITING AND NAMING FRUITS.

SECTION I.

NAMING AND DESCRIBING NEW FRUITS.

Rule 1.—The originator or introducer (in the order named) has the prior right to bestow a name upon a new or unnamed fruit.

Rule 2.—The Society reserves the right, in case of long, inappropriate, or otherwise objectionable names, to shorten, modify, or wholly change the same, when they shall occur in its discussions or reports; and also to recommend such changes for general adoption.

Rule 3.—The names of fruits should, preferably, express, as far as practicable by a single word, the characteristics of the variety, the name of the originator, or the place of its origin. Under no ordinary circumstances should more than a single word be employed.

Rule 4.—Should the question of priority arise between different names for the same variety of fruit, other circumstances being equal, the name first publicly bestowed will be given precedence.

Rule 5.—To entitle a new fruit to the award or commendation of the Society, it must possess (at least for the locality for which it is recommended) some valuable or desirable quality or combination of qualities, in a higher degree than any previously known variety of its class and season.

Rule 6.—A variety of fruit, having been once exhibited, examined, and reported upon, as a new fruit, by a committee of the Society, will not, thereafter, be recognized as such, so far as subsequent reports are concerned.

SECTION II.

COMPETITIVE EXHIBITS OF FRUITS.

Rule 1.—A plate of fruit must contain six specimens, no more, no less, except in the case of single varieties, not included in collections.

Rule 2.—To insure examination by the proper committees, all fruits must be correctly and distinctly labeled, and placed upon the tables during the first day of the exhibition.

Rule 3.—The duplication of varieties in a collection will not be permitted.

Rule 4.—In all cases of fruits intended to be examined and reported by committees, the name of the exhibitor, together with a complete list of the varieties exhibited by him, must be delivered to the Secretary of the Society on or before the first day of the exhibition.

Rule 5.—The exhibitor will receive from the Secretary an entry card, which must be placed with the exhibit, when arranged for exhibition, for the guidance of committees.

Rule 6.—All articles placed upon the tables for exhibition must remain in charge of the Society till the close of the exhibition, to be removed sooner only upon express permission of the person or persons in charge.

Rule 7.—Fruits or other articles intended for testing, or to be given away to visitors, spectators, or others, will be assigned a separate hall, room, or tent, in which they may be dispensed at the pleasure of the exhibitor, who will not, however, be permitted to sell and deliver articles therein, nor to call attention to them in a boisterous or disorderly manner.

SECTION III.

COMMITTEE ON NOMENCLATURE.

Rule 1.—It shall be the duty of the President, at the first session of the Society, on the first day of an exhibition of fruits, to appoint a committee of five expert pomologists, whose duty it shall be to supervise the nomenclature of the fruits on exhibition, and in case of error to correct the same.

Rule 2.—In making the necessary corrections they shall, for the convenience of examining and awarding committees, do the same at as early a period as practicable, and in making such corrections they shall use cards readily distinguishable from those used as labels by exhibitors, appending a mark of doubtfulness in case of uncertainty.

SECTION IV.

EXAMINING AND AWARDING COMMITTEES.

Rule 1.—In estimating the comparative values of collections of fruits, committees are instructed to base such estimates strictly upon the varieties in such collections which shall have been correctly named by the exhibitor, prior to action thereon by the committee on nomenclature.

Rule 2.—In instituting such comparison of values, committees are instructed to consider: 1st, the values of the varieties for the purposes to which they may be adapted; 2d, the color, size, and evenness of the specimens; 3d, their freedom from the marks of insects and other blemishes; 4th, the apparent carefulness in handling, and the taste displayed in the arrangement of the exhibit.

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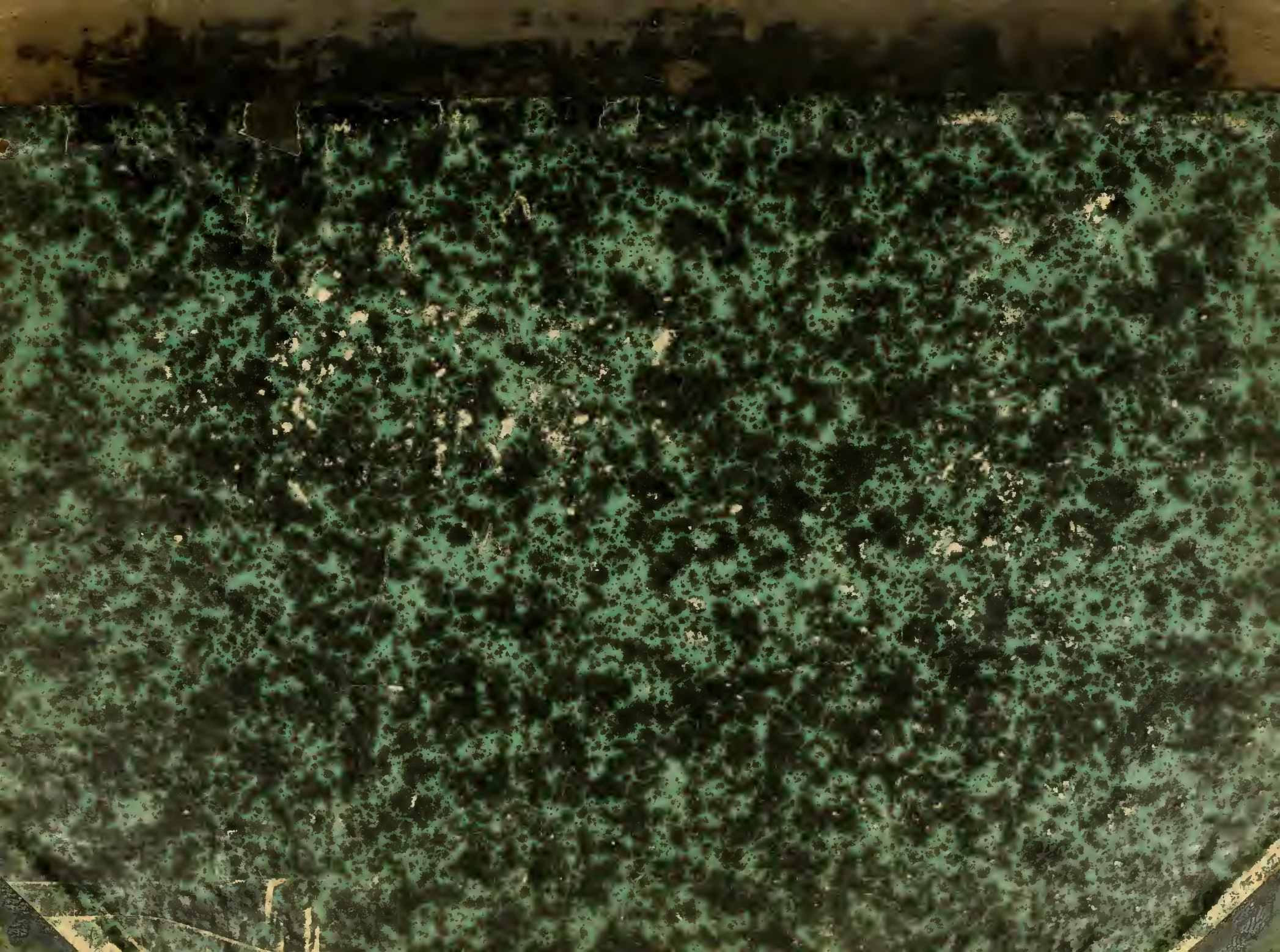
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